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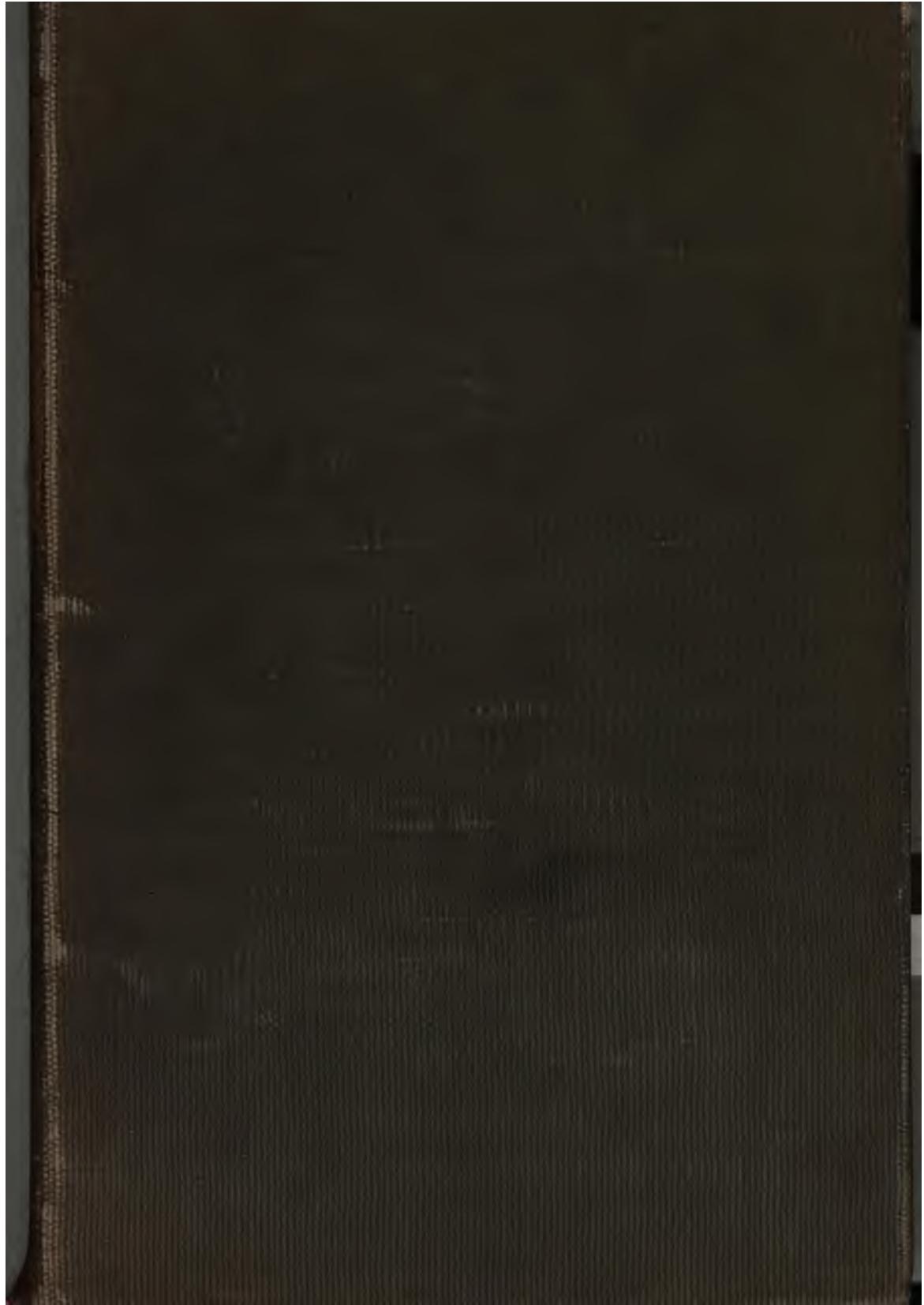
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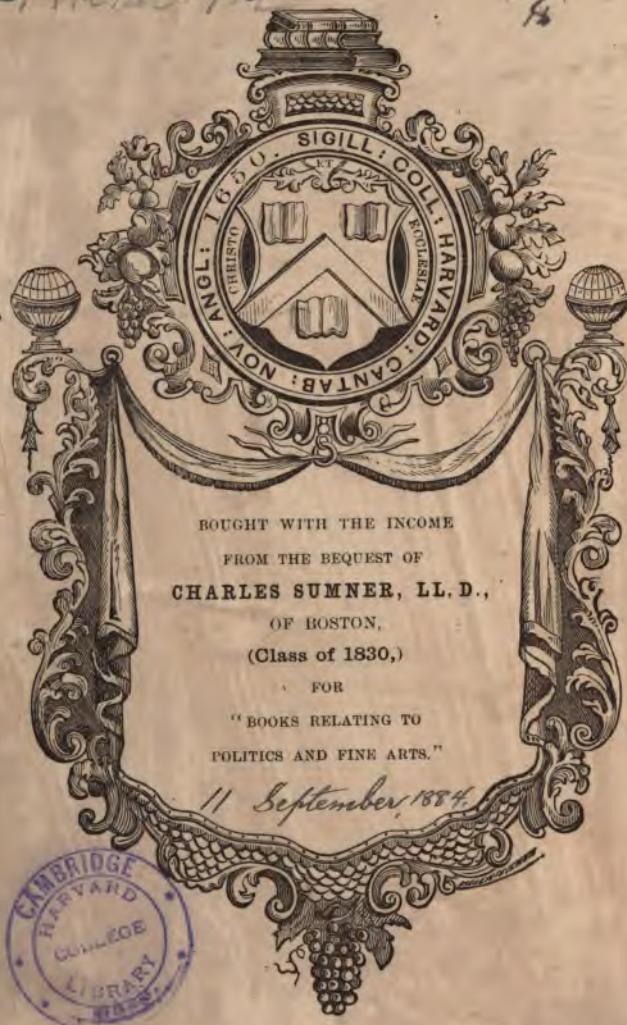
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AN

HISTORICAL AND PRACTICAL

GUIDE

TO

ART ILLUSTRATION,

IN CONNECTION WITH

BOOKS, PERIODICALS,

AND

GENERAL DECORATION.

WITH NUMEROUS SPECIMENS OF THE VARIOUS
METHODS.

BY

JAMES SHIRLEY HODSON, F.R.S.L.,

Author of "A History of the Printing Trade Charities," &c.

—London:

SAMPSON LOW, MARSTON, SEARLE & RIVINGTON,
CROWN BUILDINGS, 188, FLEET STREET, E.C.

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DEDICATION.

To the Master, Wardens, and Court of Assistants
of the Worshipful Company of Stationers.

Gentlemen,

The Stationers' Company being the time-honoured guardians of every undertaking connected with the Art of Printing, and the crafts associated therewith, there appears to be a propriety in dedicating to you a work upon the subject of Book Illustration.

There is also another and a personal reason for this dedication. I desire to acknowledge the interest in the subject and the encouragement offered me on the occasion of my recently delivering a lecture upon "Pictorial Illustrations to Literature," in the Hall of your Company.

I subscribe myself

Your obedient Servant,

J. S. HODSON.





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P R E F A C E.



N tracing the Art of Illustration from its first crude efforts to the present time, it is observable that no change of any importance is met with prior to the commencement of the century in which we live.

The older forms of plate and wood engraving occupied the entire field during the first three hundred years of the Art, and the only noticeable variations during that period were the results of a very gradual advancement towards perfection in previously acquired methods. Since the beginning of the present century, however, frequent and important discoveries have been made and new methods devised.

Lithography was the first of the discoveries intended to facilitate, or to supersede, engraving, and dates in this country from the publication of "Specimens of Polyautography," which appeared in 1801.

Various mechanical and chemical processes of engraving have since been introduced, some of which had merely the appearance of novelty to recommend them, while others are now in course of successful development.

The marvels of photography, as a means of obtaining pictures by the aid of the sun, were unknown fifty years ago; at the present day, pictures produced by the same wonderful agency are turned almost automatically into printing surfaces capable of being used for book illustration.

The work of perfecting the existing methods of engraving, and the discovery of entirely novel processes, have during recent years advanced so rapidly that the technical knowledge of the Art of

PREFACE.

Book Illustration has become developed into an important and special study. America, Austria, Bavaria, England, France, Germany, and Russia, have each made contributions to the science, the results of several of which are mentioned and illustrated in the following pages.

The present work is the result of the first effort in this country to bring together the most important of the various new methods of engraving, including those which are mechanical and chemical, as well as those which are based upon the application of the discoveries of photography. The aim has been to provide a practical guide to enable authors, publishers, and printers to ascertain the means most suitable to be employed in illustrating their works. The artist, it is hoped, may also acquire from these pages some technical information calculated to be of service in suggesting appropriate methods for special classes of illustrative work; and those who are contemplating joining the ranks either of artists or engravers may find this work useful as a Hand-Book to the subject.

The most reliable authorities in each department of the work have been consulted, and the writer acknowledges with gratitude his obligations to Mr. G. W. REID, Keeper of the Prints at the British Museum, and also to Mr. LOUIS FAGAN. To Mr. EDWARD DALZIEL, Messrs. A. & W. DAWSON, Mr. G. P. DINEEN, Mr. FRY, Herr THEODORE GOEBEL (Stuttgart), Mr. MICHAEL HANHART, Mr. R. HILTON, Mr. FREDERICK IVES (Philadelphia), Mr. R. WILKINSON, Mr. W. B. WOODBURY, and others, similar acknowledgments are due for valuable technical hints.

The works which have been principally consulted are those by M. BRYAN, J. STRUTT, Mons. VIDAL, Mons. G. DUPLESSIS, Mons. A. DAVANNE, Messrs. JACKSON & CHATTO, Dr. WILLSHIRE, Mr. HAMERTON, Mr. SEYMOUR HADEN, Mr. A. W. TUER, and Dr. THAUSING (Mr. Eaton's translation). To Mr. A. H. WALL is due the "Gossipy General Introduction" which commences the work.

The opportunity of exhibiting specimens of the various processes is also a matter of importance, and the co-operation of the artists and engravers who have thus contributed to the interest and success of this undertaking is here thankfully recognised.

J. S. H.

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ART ILLUSTRATION.

PART I.

A Gossipy General Introduction.



T is curious to look back to the time when, in all London, we had but two print-publishers—one of the twain being John Tunny, whose shop in Fleet Street was known, before houses were numbered, by its rampant sign, The Golden Lion. The few prints then published were chiefly of foreign origin, and consisted, in the main, of copies and portraits. What English Engravers we had—and they were very few—then found their chief support in engraving—as the painters found their chief support in painting—Portraits.

In the 17th century, Michael Vandergucht, a Fleming, master of the English engraver, George Vertue, settled in London. Soon after, another engraver of eminence arose in this country, John Faber, the younger, a famous mezzotinto engraver. But they both—especially the latter—found very little to do, apart from portraits. Faber, in 1735, engraved those portraits of the Kit-Cat Club, which we sometimes find carefully preserved in the folios of the curious.

Amongst English professors of Engraving at that time, the most famous were George White, who practised chiefly in mezzotinto, and John Smith, the best mezzotinto engraver of his day, whose prints, although they are not exactly rare, are still highly valued by collectors. Succeeding them, George Vertue, for a time almost monopolised the practice of English Engraving, so that, when comparing his professional position with that of his predecessors and contemporaries, or with the great Flemish historical engraver already mentioned, we can understand why his master used to say, jocularly : "The ball of Fortune was tossed up, to become at last the prize of Vertue." His apprenticeship with Vandergucht terminating in 1709, at the end of its seventh year, he turned his attention to what was then a miserable resource indeed—drawing and engraving for book-illustrations. But he soon drifted from that unrewarding work into the only branch of Art which John Bull had a care for —portraiture. Industrious, studious, and modest, although ambitious, he rose to great excellence and repute. He was one of the first members of the Academy of Painting, of which Sir Godfrey Kneller was president in 1711. Aided by his wealth and lofty patronage, he devoted his most earnest and untiring efforts to the elevation, extension, and improvement of his art, giving Engraving a degree of general attractiveness and importance which it had never before acquired in this country. The University of Oxford employed him for many years to engrave their almanacks, for which, instead of the usual meaningless, stupid emblems, he supplied views of important public buildings and historic events. At last, that branch of

Art to which his earliest aspirations and tastes led him, presented an opening, of which, when he was freed from the bonds of apprenticeship, he enthusiastically availed himself. In 1724 *Rapin's History of England*, written in French, was published in quarto at The Hague, and a translation of it by Nicholas Tindal, rector of Alverstock, in Hampshire, appeared soon after in this country, creating a great sensation. The first volume was published in 1725, the last in 1731. This was embellished with portraits by Vertue. So popular did it become, and so great was the demand for it, that in 1732 another edition was published in folio, and in weekly numbers. That was the first serial illustrated work this country knew. Vertue has recorded the fact that thousands were sold every week, and says: "It became all the talk of town and country." The Press hailed it with enthusiastic acclamations, and we have before us an article written for *The London Magazine* of 1732, which says: "Rapin hath shown that the people have their rights, as well as kings their prerogatives; that our monarchy was not absolutely hereditary;" and so on, adding: "in a word, *Rapin's History* will furnish the people of England with the best materials against the two worst evils under the sun—*i.e.*, superstition and tyranny; and therefore this book should be in the hands of every Englishman, and engraven on his heart." Its success brought other serial illustrated works into the field, which rapidly increased in number, sowing the seeds of that vast field of illustrated literature which is now a common source of universal knowledge and delight. The connection between Drawing, Engraving, and the Printing-press (which has done so much for both Art

and Literature), strengthened every succeeding year. From that time forth, Engraving grew in demand, and began to develop native talent. Young artists went abroad to study the Art, and Boydell, Strange, Basire, Ryland, Woollett, Sharpe, Smith, Rooker, Hayman, Gravelot, Vivares, and others, formed the vanguard of a constantly-increasing army, which marched steadily on to fresh conquests. Illustrated books and magazines being in demand, trade rivalry generated a more enterprising spirit—the rate of remuneration increased, a better class of engravers arose, the drawings assumed a more artistic and highly-finished aspect—and painters of the greatest eminence began to work as book-illustrators. Novels, histories, works of travel, passing events, art and science, were all illustrated, and hosts of political caricatures were engraved, to meet a demand so impulsive and general, that, when a new caricature appeared by some popular draughtsman, there was a crush at the publishers' doors immediately on their opening, like that at the entrance of a theatre on a Boxing Night.

Amongst the earliest workers in this new world of Art was William Hogarth. He was then in the full vigour of his life and genius, selling his pictures by auction for miserable prices, neglected and humiliated. In 1729, when thirty-two years old, he had taken to himself a wife, and finding the maintenance of his family becoming an increasing responsibility, he turned his thoughts to painting such stories and scenes from real life as would preach dumbly, yet eloquently, to the masses, in engravings, which, sold cheaply, should compensate by the number of their purchasers for the smallness of their prices. So, in 1733, appeared that

famous series of prints "The Harlot's Progress," published by the artist and engraver, at the sign of The Golden Head, in Leicester Fields. Twelve hundred copies were at once subscribed for. But alas! scarcely had these engravings appeared, before his bright, glad hopes were cruelly crushed. They were copied everywhere and in every way for decorating furniture, for pottery, and for framing. Hawkers scattered pirated copies of them of all kinds, in every direction, all over the country. They created an extraordinary sensation. Preachers dwelt upon them in their pulpits; stories were based upon and published with them, and the pirates reaped a rich harvest. So poor Hogarth found his little mine of promised wealth exhausted by the thievish plans of these numerous unscrupulous and active enemies. He called a meeting of his professional brethren, which resulted in indignant protests, and an application to Parliament for a Bill to suppress such wholesale knavery. The Art of Engraving, however, had received a fresh impetus. Framed and glazed engravings began to be fashionable on the walls of luxurious homes, and were in great demand amongst the middle classes of society. Collectors began to fill folios, and dealers in prints began to multiply all over the Metropolis. A Copyright Act, obtained by Hogarth in 1734-35 (the 8th of George II.), still further improved the prospect. Unknown artists of merit sprang into fame, by virtue of the publicity Engraving gave their works; and prints by English masters began to be exported. The publishers no longer sent abroad for book-illustrations, or bought up impressions from the plates of foreign artists. English artists, instead of weeping, laughed when they told how the celebrated

publisher, Tonson, in 1703, was compelled to visit Holland to get the plates engraved for his folio edition of *Cæsar's Commentaries*, published in 1712.

In 1741 Mr. John Boydell, afterwards Alderman and Lord Mayor of London, began to publish his Views of London at a shilling each. He was a young man whose natural passion for Art induced him to walk from Shropshire (or was it Derbyshire?) to London, and apprentice himself for seven years to Mr. Thomas, an engraver whose work he enthusiastically admired. He worked hard as an apprentice, and spent most of his leisure in the evenings at the St. Martin's Lane Academy learning Drawing. Emerging from apprenticeship, his first published plates were sold in little sixpenny and shilling books, and he himself told Mr. J. T. Smith how he induced the toy-shop keepers to sell them for him. Every Saturday he visited these shops, to receive the money for those sold and leave others in their place. His most successful shop was one bearing the sign of The Cricket Bat, which flourished in Duke's Court, St. Martin's Lane. They used to do wonderful things for him there. Sometimes they sold as many as realised the sum of five shillings and sixpence !

In 1755 he was a prosperous gentleman, employing a staff of clever assistants, whose training it was his delight to superintend, and, as he says, "to hold out encouragement to young artists in his line, and thereby somewhat contribute to improve the Art in this country." For about half a century he continued, as Mr. John Pye says in his *Patronage of British Art*, "spreading British engravings abroad, bringing himself fresh wealth, which he again embarked in new projects,

and by keeping its current flowing amongst artists, controlling their studies and governing their practice, had no doubt a powerful influence on the formation of the national character of British Art; whilst, at the same time, it turned the Foreign Print Trade in favour of Great Britain."

"Just before this time," says another writer on the subject (Mr. John Gould), somewhat too sweepingly, and with a degree of exaggeration, "Wotton's portraits of hounds and horses, grooms and squires, with the distant view of the dog-kennel and the stable; and Judson's portraits of gentlemen in great-coats and jockey-caps, were in high repute. Inferior prints from poor originals were almost the only works our English artists were thought capable of performing; and, mortifying as it must be to acknowledge it, yet it must be admitted that, with the exception of the inimitable Hogarth and two or three others, the generality of them were not qualified for much better things. The powers of the artists were, however, equal to the taste of the majority of their customers; and the few people of the higher order, who had taste for better productions, indulged it in the purchase of Italian and Flemish pictures and French prints, for which, even at that time, the Empire was drained of immense sums of money. To check this destructive fashion, Boydell sought for an English engraver who could equal, if not excel them, and in Woollett he found one."

In the British Museum the series of Mr. Boydell's Views of Old London are carefully preserved. Remembering that they carry us back more than a century they are extremely valuable and interesting, but as works of Art their rank is of the lowest. Yet they

were the source from which sprang rank and fortune. The Museum copy is a presentation one from the artist to the sister of Sir Joseph Banks, and to one of the blank leaves is attached an autograph note, of which the following is a copy:—

“Alderman Boydell's respectful compliments to Miss Banks, desires her acceptance of a collection of prints. The author does not claim any merit in the execution of them, but presumes it may be thought worthy of remark, that it is the only book that ever had the honour of making a Lord Mayor of London.

“Cheapside, 29th March, 1792.”

Miss Banks, sister of the famous naturalist whom “Peter Pindar” so severely satirised, was herself a learned lady who had a great passion for collecting coins, and who, when young, was a famous driver of four-in-hand. She is described as going about when old in a Barcelona quilted petticoat with a huge pocket on either side for the convenience of carrying books, with which they were always stuffed, and wearing over it a long stomachachered gown drawn up into a bunch through the pocket holes.

Alderman Boydell—of whom the late Walter Thornbury wrote, “he did in his line more for English Art than all the English monarchs from the Conquest downwards”—at the time when he employed Woollett, had risen to the dignity of owning the whole of the print shop, of which he had formerly rented but half, and the first work executed for him by this clever engraver was a copy of Wilson's “Niobe” in the gallery of H.R.H. the Duke of Gloucester.

“Before he ventured upon the task,” says the famous Alderman, “I requested to know what idea he had as

to the expense ; and, after some consideration, he said he thought he could engrave it for one hundred guineas. This sum—small as it may now appear—was to me an unheard of price, being considerably more than I had given for any copperplate. However, serious as the sum was, I bade him get to work, and he proceeded with all possible cheerfulness, for as he went on, I advanced him money ; and though he lost no time, I found that he had received nearly the whole amount before he had half finished his task. I frequently called upon him, and found him struggling with serious difficulties, with his wife and family, in an upper lodging in Green's Court, Castle Street, Leicester Fields.” After permitting poor Woollett to draw other twenty-five pounds, “the worthy Alderman” (there is no mistake about the worthiness in this case) said : “Mr. Woollett, I find we have made too close a bargain with each other ; you have exerted yourself, and I have gone beyond my strength, or, indeed, what I ought to have risked, as we neither of us can be aware of the success of the speculation. However, I am determined, whatever the event may be, to enable you to finish it to your wish ; at least to allow you to work upon it as long as another twenty-five pounds can extend ; but there we positively must stop. The plate was finished ; and, after taking a very few proofs, I published the print at five shillings, and it succeeded so much beyond my expectation that I immediately employed Mr. Woollett upon another engraving from another picture by Wilson, and I am now thoroughly convinced, that had I continued in publishing subjects of their description, my fortune would have been increased ten-fold.” To this we may add that the

"Niobe" was published in 1761, and realised for the boldly speculative Alderman a profit of two thousand pounds.

William Woollett was born at Maidstone on August 27th, 1735, and died May 23rd, 1785. His grave was made in the churchyard of Old St. Pancras. There is an India-paper proof of his fine plate, the "Niobe," in the Museum, where, as a most interesting relic of British Art history, we trust it will be carefully preserved.

Robert Strange was contemporary with Woollett. He was, as Mr. John Thomas Smith—nicknamed "Rainy-day" Smith—tells us, a native of North Britain, apprenticed to his (Smith's) father, as an engraver.* In 1745 he was out with the rebels, and the troops with which he served being put to flight, he separated from them, and, being hotly pursued, at last sought refuge in a house, the door of which he luckily found open. Panting and exhausted, he staggered into a room, in which a young lady was seated at needlework, wearing, after the fashion of her time, an immense hoop. The poor rebel implored her protection and some place of concealment. Without rising, or being in the least degree disconcerted, she quietly bade him get under her hoop. The house was duly entered by the angry soldiers, who, it will be remembered, showed no mercy to rebels, although they were respectful enough to ladies. Miss Lumsdale was found singing at her work, and they did not disturb her—merely apologised, and retired. Strange afterwards married the lady, and she made his home a very

* According to other authorities, he served his apprenticeship with Mr. Cooper, an Edinburgh engraver.

happy one. The king forgave him, and, recognising the important service he had done British Art in raising the character and mercantile value of Engraving, knighted him. Smith says: "No man was more incessant in his application, or fonder of his Art, than Sir Robert Strange; nor could any publisher boast of more integrity as to his mode of delivering subscription impressions. He never took off more proofs than were really bespoken, and every name was put upon the print as it came out of the press, unless it were faulty; and then it was destroyed—not laid aside for future sale, as has been too much the fashion with some of our late publishers." Sir Robert was born in 1721, and died in 1792. He was a member of the Royal Academy in London, and of several foreign academies. His best known works are the series of copies he made from well-known pictures, reproducing, with wonderful accuracy, the different textures of drapery, flesh, metal, stone, &c.

In 1752 English Art was no longer subjected to the neglect and humiliations it had so long endured. The stupid old tradition which attributed to the English climate or race something antagonistic to the successful pursuit of Art, was no longer insisted upon as an absolute fact beyond denial. In that year, Dalton commenced his varied career, in which he became famous as draughtsman, engraver, printseller, publisher, and librarian to George the Third. *The Gentlemen's Magazine* of March, 1791, claims for Dalton the credit of first engraving views of Greece and Egypt, but the writer appears to have overlooked the fact that some views of Greece—such as they were—appeared in the illustrations to Sir George

Wheeler's *Journey into Greece*, which was published in London in 1682.

At this time, John Keyse Sherwin achieved high repute as a fashionable portrait engraver. The Society beauties of his day thronged his studio to be immortalised on copper. His portrait of Mrs. Siddons as the Grecian Daughter may be remembered. With the graver only, and without any preliminary drawing, he engraved another portrait, also well known to collectors—that of the famous and fascinating Mrs. Robinson, then in the full blossom of her charms. Sherwin was born at Eastdean, in Sussex, and began life as a woodcutter. His first master was Bartolozzi, whose favourite pupil he was. He died in 1790. Sherwin was a generous free-handed man, but utterly wanting in honesty; a gambler, often in serious difficulties, and always in debt. Numerous ludicrous, and some sad, stories are told of his career. With all his faults, however, he was a great favourite, and never without friends. One story, illustrative of this fact, told by "Rainy-day" Smith, in his *Life of Nollekens*, we venture to reproduce. He says:—

"Various and often singularly interesting, were the scenes which I witnessed during my short stay with Sherwin," (Smith was his apprentice), "and a recollection of some of them, even now, affords me no small degree of pleasure in my evening walks. I well remember one in particular, which always occurs to me whenever I hear the late Lord Fitzwilliam mentioned. One afternoon his lordship, entering the studio, and being assured that Sherwin was not in the house, saw a man of elephantine proportions arise to address him. He said:—

"'Sare, he is at home. My name is Elbell ; I am un tailleur un habit-maker. I live at No. 65, Vells Street, Oxford Market ; he ordere me to come here for amount of my bill, an' I have been vaiting here no less dan dese five hour; an' until I am distinctly satisfy, I vill not go avay vidout my money. I make for Colonel Topham, sare, an' Major Hanger, an' dey nevare vill serve in such a vay !'"

His lordship paid the tailor's bill, obtained a receipt, sent word that he had done so to Sherwin, who immediately appeared, gorgeously arrayed, after the fashion of a "buck," in "a scarlet lapelled coat, with large gilt buttons, each the size of half-a-crown ; a white satin waistcoat, embroidered with sprigs of jasmine ; a pair of black satin small clothes, with Bristol-stone knee-buckles ; a pair of Scott's liquid-dye blue silk stockings, with Devonshire clocks ; long quartered shoes, with large square buckles, which covered the whole of the lower front of the instep, down to his toes ; a shirt with a frill and ruffles of lace ; his hair pomatumed and powdered, with an immense toupee, three curls on a side, and tied up with a tremendous club behind."

Speaking of the extraordinary rapidity with which this amusing, unprincipled, rake worked, Smith says he often began a plate in the evening, worked at it through the night, and finished it in the morning ; he adds :—

" Tom Davies, the bookseller, applied to him one Saturday to engrave a head of Garrick for that actor's *Life*, at the price of fifteen guineas, and it was to be done immediately. Sherwin, who was, I am sorry to say, too much like many other artists, fond of working

upon Sundays, sent this plate home on Monday morning, completely finished, to the great astonishment of Davies, and everyone else who knew the fact." A once-well-known but now very rare portrait of the Earl of Carlisle, elaborately engraved from Romney's painting, after being in hand and untouched for three months, was executed in four days.

The introduction of chalk-engraving from Paris by Wm. Wynne Ryland, the pupil of J. P. Le Bas, and of the aquatinto process by the father of water-colour painting, Paul Sandby, one of the original members of the R.A., by which the effects of drawings on bistre and india ink were given to engravings, added new attractions for print-purchasers, and gave fresh popularity to the Art amongst those whose patronage is, after all, the only permanent and sure channel of advancement for native talent—the million, at home and abroad.

In little more than thirty years British Engraving had sprang up from its condition of poverty, degradation, and obscurity, to a source of wealth and honour for its professors and publishers, a source of profitable employment for artists, and a means of increasing and elevating the public taste in Art generally, to say nothing of its influence in swelling the accumulations in the public treasury.

Francesco Bartolozzi came to England in 1764, and here obtained rare distinction in the practice of every species of engraving. His etchings in imitation of the drawings of eminent painters, raised him to the highest rank in his profession, and awakened quite a new spirit of emulation in the loftier walks of the Art. Bartolozzi was the first and only engraver elected to the full honours of the Royal Academy.

From about 1780 the talents of Stothard and Heath exercised a most important influence upon the progress of illustrated literature ; while from the commencement of the war which followed the French Revolution, a spirit of rivalry raged in the production of wood engravings which considerably raised their standard of artistic value. Rambach's, Warren's, W. Finden's, and Golding's steel engravings will be remembered as belonging to this period, the introduction of which caused copper to gradually fall into disuse. Eighteen and twenty guineas began to be paid for the engraving of single small plates. To this period belonged the introduction of assistants of inferior talent to execute the more mechanical portions of an engraving.

Mr. James Heath, it will be remembered, was to Thomas Stothard, R.A., what F. Bartolozzi, R.A., was to G. B. Cipriani, R.A., who died in 1785. He worked for Boydell, and from about 1780, and during the war with France, which followed the terrible revolution in that country, the combined talents of Stothard and Heath added a new impetus to the progress of the Art, and gave it a still wider application in providing book illustrations.

Amongst those then called forth who were, by the strong spirit of emulative rivalry, to aid the good work, were Raimbach and Warren, Golding and W. Finden, whose careers belong to what must be regarded as the palmy days of British Engraving. They gave engravings a much higher degree of finish, delicacy, and power. About this time steel gradually took the place of copper for engraved plates, and a new element sprang up which threatened serious mischief. The high merit

and beauty of works executed by the men whose names we have mentioned, had of necessity increased their cost as well as their popularity. This encouraged a species of commercial rivalry, resulting in attempts to cheapen their production by the employment of assistants, who, first employed on subordinate parts, by degrees usurped positions for which they were unfitted, either by ability or education. If we compare the plates in the following works with those which succeeded them in similar publications, the retrogressive effect of this system of cheapening the production of high-class art works will be sufficiently apparent, namely :—

Du Rovery's edition of Pope, with engravings after Westall and others. Sharpe's edition of the Classics (1803), with plates engraved by Bromley, Raimbach and Warren ; Parker's and W. Sharpe's plates in the *Spectator*. Mr. Warren's illustration, after Smirke, to "The Heiress," in Inchbald's *Theatre*; his plates for the "Arabian Night's Entertainments," also after Smirke ; his "Ulysses" and "Penelope's Suitors," after R. Cook ; and his copy of Wilkie's "Broken Jar," &c. Also Raimbach's plates in Suttaby's edition of the *Spectator*, after Stothard ; in "Don Quixote," and the volume of selected papers from *The World*.

Raimbach, speaking of the book-illustrations of his day, says—"The names of Du Rovery and Sharpe may be cited as among the most active speculators in ornamental literature who sought the aid of engravers," and he adds : "The impulse now given by the encouragement of the public brought, of course, other publishers into the field of competition ; among whom may be named Messrs. Longman, Cadell, Suttaby, Kearsley, and Miller."

In 1823, at a meeting of the members of The Artists' Fund Association, which originated in the philanthropic efforts of a talented engraver, Mr. Edward Scriven (who was born at Alcester, near Stratford-on-Avon, in 1775, and died in 1841). Mr. John Pye, the eminent landscape engraver, proposed that to aid its funds that society should publish a series of high-class engravings. The plan was adopted, and the first work produced was the well-known plate from Mr. Mulready's picture, "The Wolf and the Lamb," the original of which was then the property of the King. The engraver was Mr. J. H. Robinson. Its sale not only proved a great success, but, with the succeeding plates, did much for preserving the Art in popular estimation.

As steel displaced copper, so wood began by slow degrees to displace steel. At first, timidly imitative of work on an altogether different material—copper or steel—wood-engraving gradually diverged into effects peculiarly its own, and, having a tendency to cheapness, suffered its fatal effects in deterioration of style, aim, and effort. The pioneers of this new phase of engraving—chiefly applied to the adornment and illustrating of books—were Thomas Bewick and Robert Branston. For patient, careful work and loftiness of aim, Bewick's work still retains the, or at least a foremost place in the Art. However coarse the execution in some of his blocks may seem to the untrained eye, every line is the evident result of careful artistic study, and every new effect in execution has evidently been made with a purpose, genuine in intent, and legitimately achieved, especially when considered with due reference to the method of printing from a

wood-block, as opposed to that of printing from a plate of steel or copper.

Branston began his career as a copper and steel-plate engraver, and his works, masterly as they are, show that while the manipulative skill given by his early practice stood him in good stead, yet the attempt to combine the best qualities of wood and copper was not very satisfactory in the hands of such wood-cut printers as then existed, and who doubtless exercised a very troublous, perplexing, and care-creating influence on the minds of those who were endeavouring to secure a lofty place in Art for engravings on wood. Amongst Branston's pupils was John Thompson.

Thomas Bewick and his brother John illustrated their own books on natural history. John died of consumption, in 1795, and his more illustrious and better known brother, of gout, in 1828. Amongst the pupils of Thomas Bewick were Luke Clennell, Charles Nesbitt, and William Harvey, who was afterwards one of Haydon's pupils.

That the earlier wood-blocks were cut with knives, and not gravers, is a fact to be remembered when we are examining prints from them by such poor block printers as the Art could in its infancy command.

Another early wood-engraver, of genuine merit, was the pupil of Branston, already named, John Thompson. To him the young Art was greatly indebted for its early progress. He improved the tools, gave greater care to the choice of material, and brought a large amount of practical study and artistic ability to the successfully achieved task of spreading abroad into a wider field the growing demand for wood-engravings. To him also we owe increased care and intelligence

infused into the business of printing wood-engravings. Like his predecessors, however, he fell into the error of imitating, in one material and method of printing, the beauties and effects specially fitted for another and very different material and method of printing.

Without tracing wood-engraving down from that to the present period, and noting the new processes of cutting which, steadily improving, kept pace, foot by foot, with improvement in the methods of printing from relief blocks, we may point out that the very element which worked so much evil to engraving on steel and copper was soon active in lowering the artistic quality of wood-engraving—that is to say, cheapness.

Wood-engravers began to aim far beneath the aspirations of those who practised the older methods, and substituted for the higher and intellectual qualities of engraving—for the sake of cheapness—hard, coarse execution, devoid of all artistic feeling. Then mere mechanical dexterity took the lead. Composition, expression, sentiment, and the more refined technical qualities and perfections were sacrificed for the sake of simplicity, dexterity, and rapidity in character and execution. Apprentices began, in fact, to do for wood-engraving what inferior assistants had done for the old copper and steel plate engravings: artisans took the place of artists.

Presently the evil which created this mischief began to work its remedy. Wood-engravings assumed a character so devoid of artistic qualities, so essentially mechanical in method and effect of execution, that shrewd thinkers at once concluded that machines might readily enough be put in the place of those who cut them.

The artists who grew dissatisfied with this mechanical method of translating, and to create some improved, but still mechanical system which should do away with that of the engravers, adopted a style of drawing which required nothing more than care, patience, manipulatory skill, and accuracy on the part of the mechanics who engraved them.

The increased popularity achieved by drawings thus made and engraved, played strongly into the hands of those who were hard at work devising new schemes for the perfection of automatic systems of engraving. These are now so steadily growing in power and attractiveness that they threaten, wholesomely enough, to drive wood-engraving to that higher ground which it can more worthily and strongly occupy, and on which it may stand without a rival.

In proof of this, we may point out that it is rapidly becoming more common to desert the mere wood-draughtsman, who has adapted his style to the mechanical requirements of the fac-simile and mechanical wood-engraver, in favour of the painter, whose monochrome paintings, executed with as much care, thought, and expenditure of time and labour, as if they were for sale or exhibition simply as paintings, are reproduced upon the wood and translated into a language essentially that of a kindred spirit of almost equal power, one who uses his graver with the thought and technical ability of a genuine artist.

Although many make moan over this, and see in it an influence detrimental to Art progress, in its more popular and commercial aspects, we cannot sympathise with them. To us it seems, in every way, a most

desirable and healthy state of things, with which we have no desire to interfere, unless it be, as we hope, helpfully.

The earlier attempts in the direction of automatic engraving were mostly based on the same principle, that of "biting" away the metal with acids. The great difficulty encountered was in the action of the acid, being exercised not only in the direction required, but in that direction in which it was most undesirable—that is to say, not only downward, but laterally. The more prolonged the action the more fatal to success was the lateral biting of the acid. In vain were experiments tried with partial inking, electrotyping, gilding, protecting varnishes, &c.; the result was, for a long time, continual failure.

The first successes in this direction were made in the processes of Palmer, Kobel; Volkmar-Ahner, and Besley; but largely satisfactory and promising as the results were, they demanded a special method of working on the part of the artist, whose drawings were engraved by them, which was found to be too troublesome and restrictive. These processes were based upon methods of treatment, in which lithographic ink and deposits of iron and mercury were used to secure relief, and an after process of moulding and electrotyping. M. Dulas took up the process at this stage, and, after many experiments, considerably simplified and improved it. M. Gillot and M. Comte substituted for the copper, plates of zinc. M. Dulas followed with processes—both plate and typographic processes—all modifications of the original idea. An American artist brought to London another automatic process, altogether different. In this the action was chiefly

mechanical rather than chemical. The drawing was made upon a surface of closely compressed and prepared chalk, with an ink hardening the surface it covered, and so protecting it from the action of brushing, whereby the unhardened chalk was removed, and the lines left in relief for the usual process of moulding and electrotyping. It was most ingenious and largely successful, but contained elements of uncertainty, which at last led to its being abandoned. We have now other processes which have arisen out of the above, all largely used, and when properly treated, perfectly successful.

And now, having briefly traced the progress of engraving in this country from its rise, downward to its present position of popularity and rapid growth, we turn to the more practical and useful chapters of our little book, commencing with some of those phases of the Art with which the reader will be most familiar.





CHAPTER I.

Plate Engraving.

RISE AND DEVELOPMENT OF THE ART IN GERMANY, ITALY, AND FRANCE.



THE Art of Engraving has been asserted by some to date back to the time when Moses was commanded to deliver to the Israelites the Commandments *engraven* by the finger of God; while others claim a still higher antiquity, from the assumption that the prohibition against worshipping *graven* images implies that the Art was in existence anterior to the Decalogue. Although Tubal Cain is acknowledged to have been "the first artificer in metals," this fact would scarcely justify the inference that he was also the first *engraver* on metals; neither is it to be supposed when Moses mentioned engraving, Exodus xxxv.,—"Them hath he filled with wisdom of heart to work all manner of work of the *engraver*"—that the modern idea of the art is to be understood.

Evidences of the early knowledge of engraving,—or carving,—as applied to personal ornaments are frequently to be found in the Holy writings, and indeed some specimens of the articles themselves are preserved in the British Museum, where are several signets upon which hieroglyphic characters have been carved or engraved. The shields, too, of some of the renowned warriors of early history gave occasion for the exercise of the art, and in the far-famed shield of Achilles the incisions of the engraver were afterwards filled with metals of various colours.

"The earliest Greek engravings extant," to quote from the late John Landseer's *Lectures on Engraving*, "are performed on scarabees (which attest their Egyptian extraction), and are in point of drawing, little better than the hieroglyphics; they show, however, that Greek genius laboured already to extend the graphic art to portraits and historical subjects; which is proved beyond all controversy by the additions of the names of Tydeus, Achilles, &c., which are inscribed in the early Greek character on their respective gems."

In the Oxford Museum is preserved a jewel, the centre of which represents the figure of St. Cuthbert, which is curiously ornamented with foliage skilfully engraved. This jewel it is believed was made by command of Alfred the Great, and a representation of it is to be found in Strutt's *Chronicle of England*.

Thus much will suffice as to the origin and antiquity of intaglio or gem engraving, which may be looked upon as the precursor of engraving as now understood,—or the method of producing designs upon metal plates from which impressions on paper can afterwards be taken.

The credit of the discovery of engraving, or at least of the first application of the art to the purposes of illustration, is claimed both for Italy and for Germany.

The Italian claim seems to be based upon the assertion of Georgio Vasari, who attributed the invention to Tomaso or Maso Finiguerra, a Florentine artist who flourished about 1460. According to Strutt, the first dated engravings of Italian production were the geographical charts for an edition of Ptolemy, published at Rome in 1478; but the first book illustrated with engravings was the "*Monte Santo di Dio*," published at Florence by Nicola de Lorenzo della Magna, in 1477. These engravings are attributed to Sandro Botticelli. The plates for the large edition of Dante, engraved by Baldini or Botticelli, did not appear until 1481. Finiguerra, it is said, communicated the result of his discovery to Baldini, who afterwards instructed Botticelli. There was, however, an engraved almanack containing directions for ascertaining the day upon which the moveable feast of Easter would fall "from the year 1465 to that of 1517." This being in the Italian language, sufficiently indicates the country to which it owed its origin. This plate has been erroneously attributed to Baldini. Baron Heineken, whose opinion has been considered entitled to considerable weight, favours the opinion which gives Germany the credit of the invention; and while acknowledging the claim of Finiguerra, on the assertion of Vasari, to be considered the first who discovered the art of taking impressions from engraved plates, thinks that the claim ought to be confined to Italy, adding "it is very possible that

the Art of Engraving may have been long practised in Germany and yet unknown in Italy." M. Duplessis (Conservateur Sous-Directeur adjoint au Département des Estampes de la Bibliothéque Nationale), in his "*Coup d'Oeil sur l'Histoire de la Gravure*," seems impressed with the pretensions of Finiguerra on behalf of Italy, although he admits that Germany furnishes the greater number of specimens of ancient engraving. The fact, stated by Strutt in his *Biographical Dictionary of Engravers*, that no print has been produced that can with any certainty be attributed to Finiguerra, seems to negative very conclusively the claim to originality which has been made on behalf of Italy.

The German pretensions to priority in this interesting inquiry rest upon the appearance of an engraving of "The Virgin and Child," the date 1461 appearing in the body of the plate; while Sandart mentions another, bearing the still earlier date of 1455. Dr. Willshire gives 1446 as the date of the first German plate.

In the chronological list of engravers to be found in *Strutt's Dictionary* [London, 1785], to which allusion has already been made, the earliest names are :—

JÖRG SCHAPFF, 1450, an engraver upon wood, native of Augsburg.

VEIT STOSS, 1450, a German engraver upon copper.

TOMASO FINIGUERRA, 1460, a goldsmith, of Florence.

MARTIN SCHONGAUER, 1460, of Culmbach.

The work upon which the earliest engravers were principally employed was known as *nigellum* or *niello* and very closely resembled our modern engraving

upon brass for door plates. The plates were usually of silver and the design cut with a graver. The furrows thus made in the metal plate were filled with a mixture of metals, which was caused to flow well into the lines by the application of heat. This heating also fixed the metallic mixture in its place. When the plate was again cold the surface was scraped and polished.

The only method at first known to the *niellatori* for taking proofs of their work, which was done during the progress of the engraving, was by means of a mould taken in wax or clay, in which melted sulphur was subsequently poured. In the hollow parts of this cast some ink was rubbed, and the design and condition of the engraving were thus clearly shown. Tomaso Finiguerra, who was one of these goldsmith-engravers, appears to have been the first to take impressions from such plates upon paper. This was about 1450 to 1452. Finiguerra took his paper impressions direct from the plate, as well as from the usual sulphur cast, and he is fairly credited with having led the way, by this means, to the adoption of plate-printing upon paper. These paper impressions were, however, simply proofs obtained in order to enable the *niellist* to ascertain the progress of his work. The plate engraved specially for printing purposes was of still later date. The mechanical operations of working in *niello* and engraving with a view of obtaining printed copies, although similar in some respects were not entirely identical. For instance, where a large space had to be covered with the wax it mattered not how the lines or furrows were cut, provided the outer edges of the portion cut away were

clearly defined. The wax filling up the entire space, the lines which produced that space would be completely hidden. In engraving for printing purposes, on the contrary, the shadows or dark parts of the picture are formed by separate lines, every one of which will be reproduced in the print. Hence not only was the engraver compelled to exercise his skill in the outlines of his subjects, but also in the substance and direction of the various lines which composed the shadows and tints of his picture. The *niellists* had adopted the method of cutting their lines all in one direction, as offering greater facilities for their work, and the first efforts in artistic work of such engravers were naturally based upon their previously acquired methods. The earlier specimens of engraving which have been preserved exhibit ample evidence of this method of work: subsequently curved lines came to be adopted, and for deep shadows lines crossing each other at various angles were employed.

It is pretty generally admitted that to name the artist who may justly be entitled to the credit of having discovered or invented engraving is a matter of no little difficulty. Whether he were an Italian or a German, or whether the Art were discovered in the two countries simultaneously, is not really of any great practical importance; neither is the accurate adjustment of this vexed question essential to the object of the present work. It may be that the initial efforts of these early engravers were of too primitive a character to excite in the present day any feeling beyond one of curiosity, induced by the realisation of the crude beginnings from which the Art afterwards emancipated itself.

Engraving, however, as a means of book illustration, which is the special subject under consideration, may be said to date, not from the time when the Art was discovered, or first practised ; but from the time when, the plate being engraved, means were at hand to produce impressions from the plate. It seems to be generally understood that copper-plate printing was co-existent with type printing, or very nearly so. Impressions, it is true, had for some time been taken with ink upon paper, of both plate and seal engravings, as well as from wood-cuts ; but these impressions were in all probability taken by rubbing or burnishing. Indeed, it is known with considerable certainty that this was the only method employed for taking impressions from wood-cuts prior to the invention of Guttenburg in 1441.

The art of metal engraving has since been developed into several distinct methods which may advantageously be treated under the following heads:—Line Engraving, Etching, Stipple—or engraving by dots, Chalk Engraving, Aquatint, and Mezzotint.



L I N E E N G R A V I N G .

THE earliest, and, at the same time, the most important of the several methods of engraving upon copper plates, was that known as *line engraving*, in which the entire picture is produced by lines cut upon the

face of the copper plate by a graver and dry point. The lines cut by the graver become in printing the receptacles for the ink, and thus represent the printing parts of the plate, and not, as in wood engraving, the "whites" or unprinted parts. The crossing of these cut lines or furrows is the most direct, and, indeed, the only way of producing deep shadows ; and this "cross-hatching," as it is technically called, which is extremely difficult and tedious in wood engraving, becomes in plate engraving both simple and effective. Line engraving was, for a considerable time the only known method of working upon metal, and to this day it is very justly considered the highest and most artistic form of the Art. Although the mode of procedure is, probably, the most simple of all the methods of engraving, yet, to attain success, such a combination is required of talents of a superior order as entitle the successful engraver to take rank as an artist. Besides the evidence of the prints themselves, there are other reasons which go to prove that line engraving was the only style of engraving known in the early period of the Art. One circumstance which is noticeable is that many of the early Masters employed their skill in engraving upon wood as well as upon copper, which may readily be accounted for by the similarity of the mechanical part of the two operations. In both, a graver is used which ploughs away part of the plate or wood, although very different results are produced, inasmuch as, in the case of the wood-cut, the subject or drawing is produced in relief, while in plate engraving it is sunken or in intaglio. When it is remembered, also, that many of the early engravers learned their art through the employment or instruction of goldsmiths,

and that the chasing of designs upon gold and silver plate was the precursor of artistic engraving, it may readily be believed that the method of engraving distinguished as line engraving was that at first exclusively employed. Notwithstanding the great advantages which some of the other styles of engraving undoubtedly possess, and which will be explained in their proper places, yet line engraving is, and probably always will be, the method most frequently resorted to for large plates and for subjects of a grand or historical character.

It is proposed to illustrate this work with some modern specimens of engraving in the various styles mentioned, which, besides serving the purpose of explaining to the uninitiated, far better than any merely verbal descriptions can possibly do, the peculiarities of the several methods of engraving, will afford opportunities of comparison, by which the differences between them may be appreciated. Brief historical references to those early engravers who may have materially assisted in perfecting the artistic or mechanical development of the Art, or who may have excelled in any of its various branches, may also be of use in fostering and encouraging a taste for the subject, and serve in some measure as an elementary guide to those commencing the fascinating occupation of a collector of engravings.

The German Master who is known by the initials E. S. was the first to make any advance in the Art, and 1466 is the date found upon his work; while the earliest of the German engravers on copper, who has been considered to be entitled to be called an artist, was MARTIN SCHONGAUER, of Culmbach, who died in 1486, but the date of whose birth is not precisely

known. The works of this engraver, no doubt, exercised considerable influence upon the mind of the renowned Albrecht Dürer. Schongauer has been designated "The Father of the German school of engraving;" Dr. Willshire, however, questions his right to this title, because his works shew that he was no mere novice in the Art. Like most of the early artists, he combined the occupations of goldsmith and painter with that of engraver. The mechanical excellence attained by this artist, and for which he was justly celebrated, was imitated by WENZEL VON OLMÜTZ (1481), who copied very closely the style of Schongauer and of ISRAEL VAN MECKENEN.

The names of BACCIO BALDINI and SANDRO BOTTICELLI are met with among early Italian engravers; and although some glimpses are occasionally presented of a desire to divest themselves of the earlier rude condition of the Art, yet their works have been very properly characterised as "vulgar, and inferior to those of their Northern contemporaries." It was left for the Florentine, ANTONIO POLLAJUOLO, to make advancement by a closer attention to anatomical correctness in the drawing of his figures, while his works indicate the assiduity with which he studied antique sculpture, by his presenting the figures in his historical subjects without drapery. This is strikingly observable in the medal commemorating the assassination of Juliano, and in his most renowned work, the *Martyrdom of St. Sebastian*, which, in Roscoe's *Life of Lorenzo de Medici*, is described as "exhibiting only a group of half naked and vulgar wretches discharging their arrows at a miserable fellow-creature." The technical peculiarity of his work consisted in

making the outline of his subject with the graver in firm lines, and then putting in the shading by diagonal lines from one corner of the plate to another. Still, compared either with his predecessors or his contemporaries, Pollajuolo must be admitted to have helped forward the progress of the art.

ANDREA MANTEGNA, born at Padua in 1431, was the son of a herdsman, and was entitled in the fullest sense of the term to be called an artist, for his mind was strikingly open to the advantages to be derived from criticism, even when not given in a particularly friendly spirit. It is related of him that his study of the "rich assemblage of statues and bas-reliefs," by which he was surrounded, and from which he acquired a style of pure and correct design greatly superior to his contemporaries, laid him open to the charge of possessing a "dry formal style" which was unsparingly made against his work by his early master, Squacione. Profiting by this adverse criticism, which is supposed to have been the offspring of jealousy, he exerted all his energies and painted "with admirable precision" a head of St. Mark for the Church of St. Giustina. The nature of his early study, the irrepressible love which he evinced for the Art, and the anxiety which he displayed to improve his style, all conduce to the acceptance of the assertion, that his engravings are marked, at least by correctness of design. The circumstances of the early development of the talent of this engraver, somewhat resemble those of a living English artist, who has acquired distinction by his pictures of animal life. Like Mantegna, his mind was so filled with the "feeling for Art," that he hopelessly neglected his original occupation. There was, however,

this difference between the two; in the case of the Italian the artistic fervour led to neglecting the care of his flocks, while the English lad left his occupation to practice in the open market, the sketching of the animals brought there for sale.

Mantegna, who followed closely after Pollajuolo in date, was in turn succeeded by MARC ANTONIO RAIMONDI, who was born at Bologna in 1487. It was upon a visit to Venice, that Marc Antonio (by which name he is more frequently mentioned,) first saw some of Albrecht Dürer's prints, his admiration for which led him to copy some of those from "The Life of the Virgin." It is said that these copies were sold as originals, and Dürer was so incensed at the loss which he supposed he had thus sustained, that he was induced to travel from Nuremberg to Venice to seek redress. Antonio afterwards visited Rome, where he was introduced to Raphaël, with whom he pursued his studies. He appears to have practised the Art with zeal as well as success, and was employed in reproducing, or translating, many of Raphaël's paintings. Landseer says of him, that "he certainly possessed considerable manual skill in the management of his graver, which was the sole instrument of his art; and in his knowledge of drawing went far beyond all his competitors." Strutt pronounces him to have been "one of the most extraordinary engravers that ever lived." In his time mechanical dexterity in the use of the graver was the principal consideration; and those effects of light and shade, distance and foreground, which are now looked for in engraving as much as in painting, were then comparatively unknown. Having received instruction from a goldsmith in his

native town, Marc Antonio's early attempts at engraving were executed upon silver ornaments ; he afterwards employed himself in copying Dürer's prints. The first plate that he engraved, under the direction of Raphaël, was *The Death of Lucrece*.

The influence of painters upon the art of engraving was strikingly evidenced in the case of this engraver, who, after he had abandoned the copying of Dürer's plates, submitted himself to the guidance of Raphaël, and a marked advance in his style of engraving is perceptible in his translations on to the plate of Raphaël's paintings. This great painter seems to have impressed Marc Antonio with an appreciation of the special capabilities and destiny of the engraver's art, as an equivalent in monochrome, or "black and white" of the many-coloured painting. It has been said "Raphaël inaugurated *style* into engraving, while Rubens introduced colour." "Albrecht Dürer had understood how, by variety of methods of work, to imitate multiformity in objects; Lukas Van Leyden had shewn how to preserve aërial perspective; Marc Antonio had indicated the means by which the suppleness of the graving tool should subserve the triumph of the drawing; the pupils of Rubens proceeded to shew in what manner the effects of a painting might be produced."^{*}

Besides being remarkable for the number of works which he has left to posterity, ALBRECHT DÜRER, it is almost superfluous to say, is acknowledged to have been "one of the most eminent artists that Germany has produced." It is believed, he set the example,

* M. Charles Blanc,—quoted from Dr. Willshire's "Introduction to the study of Ancient Prints."

which was speedily followed by his countrymen, of engraving upon wood as well as upon copper : he also etched a few plates, but it is for his work with the graver that he is best known. Impressions of Dürer's prints are easily procurable and at moderate prices, although some of the more scarce prints, if in good condition, fetch large sums. Further reference is made to the productions of this master in the chapter devoted to Wood Engraving.

It is noticeable that some artists who employed themselves in engraving as well as painting, became engravers apparently from a desire to popularise their own paintings by reproducing them with the graver or the etching point. They are none the less entitled to be classed among engravers, and in this particular list must be placed Albrecht Dürer, Rembrandt, and Salvator Rosa, many of whose engravings are reproductions of their own paintings. On the other hand, Goltzius, Parmigiano, Della Bella, and Callot published many prints, the subjects of which had not appeared in any other shape, but were designed specially for their own engravings. The consideration of the circumstance just named,—of the two characters of painter and engraver so often existing in the same artist,—renders the attempt to confine the attention wholly to the work of the engraver considered apart from that of the designer, a somewhat difficult problem. Not a few of the changes observable in the progress of the art of engraving are due to the development of the skill of the artist or designer, quite as much as to any advancement in the comparatively more mechanical work of the engraver. Indeed, although the occupations are manifestly separate, so intimately are they associated that it is

almost impossible to speak of one branch of operations without also alluding to the other. Thus in the development of the Art in Italy the first most distinctly marked improvement must certainly be attributed to the advancement made in the drawing or design, due no doubt to the study of antique sculpture, for which the Italians possessed singular opportunities. It may also be pointed out that the various novel methods or varieties of engraving have often been retarded in their advancement towards general acceptance by the attempt to imitate the excellences of some other previously-known method, rather than to display the peculiarity to which the new method may have been specially applicable. It is only by discovering what a new method cannot accomplish, that its real value is ascertained. For instance, etching, upon its first introduction, was sometimes made use of to imitate line-engraving,—the point was often employed to assist in the early stage of the work of the graver ;—and just in proportion as the clear-cut sharp lines of the burin were imitated was success supposed to have been attained in the work of the etching point. Subsequently the absolute value of etching came to be understood, when the fact was realized that it possessed an individuality of its own and was capable of occupying a distinct and unrivalled position in the art of engraving. In like manner the wood engraver, instead of pursuing the legitimate advantages of the wood-cut towards perfection, must needs endeavour to copy the essential peculiarities and delicacy of plate engraving, thus unwisely putting the two different occupations into disadvantageous comparison. This may, doubtless, be accounted for by remembering that in everything it is far easier to

imitate than to invent or discover, and also from the fact that those who are instrumental in introducing new ideas are generally such as may be styled experts in the old methods, or are at least strongly imbued with pre-existent theories and practice.

The first illustrated book was the *Monte Sancto di Dio*, published in 1477, as already mentioned. It is not, however, so generally known that we are indebted to about the same period for the earliest Illustrated Album, this being a form of publication popularly believed to be of quite modern date. In the Print Room of the British Museum are preserved some pages of a book, produced at the latter part of the fifteenth century, composed of printed engravings and blank pages, intended for written literary matter. The MS. additions consisted of Latin prayers and other religious effusions of little interest, and the engravings only have been thought worthy of preservation. What has been retained sufficiently indicates the character of the book, and the purpose it was intended to fulfil, which was for the insertion of MS. literary productions of the owner—or to pass from hand to hand as a receptacle for the contributions of friends.

The engravings are principally figures of saints, each figure occupying an entire page, with a plain line border marking the square of the page, the paper upon which they have been printed measuring about four by five-and-a-half inches. They are remarkably well executed for the period which has been assigned to them, the outline of the figures and drapery being sketched with a firm hand, and the drawing and proportions equally good. Very little shading has been attempted, effect being principally given by variation

in the strength or substance of the lines employed. Occasional cross-hatching incontestably proves the engravings to have been executed in intaglio upon metal.

There are also, in the same collection, some pages of a book similar in many respects, but in which the engravings are much smaller, and appear to have been made to serve the purpose of initial letters or devices, which were afterwards to be illuminated by hand.

The name of LUKAS VAN LEYDEN, born 1494, is often mentioned as one of the distinguished engravers, and indeed he has been styled "the Patriarch of the Dutch School." He certainly was one of the most precocious, for it is related of him that at the early age of nine he had engraved a plate from his own design. He used the point as well as the graver. Albrecht Dürer was his contemporary, and the inevitable comparison with the greater light was to the disadvantage of Van Leyden, who was thus noticed as being deficient in design. His engravings are neat, but, compared with Dürer's, are wanting in firmness. Bad or worn copies of the plates of this engraver are met with in the catalogues of the dealers at moderate prices.

HENDRIK GOLTZIUS, born 1558, imitated with considerable success, the works of his predecessors, Dürer and Van Leyden. He is particularly noted for his set of six large plates called "The master-pieces of Goltzius," which were engraved and so designated to shew his ability in copying the old masters.

HEINRICH ALDEGREVER, born at Zoust in 1502, was one of the "Little Masters," as they were called from the fact of their having exercised their talents principally upon small plates. He worked entirely with

the graver. Another of the little masters who worked upon wood as well as upon copper was VIRGIL SOLIS, who was born in 1514 at Nuremberg.

GEORGE PENCZ, born at Nuremberg, about 1550, is one of the most important of the little masters, and although he executed some large plates which are much esteemed, his reputation is based upon his smaller subjects. The collector will have no difficulty in procuring specimens from the dealers.

Of the family of the CARACCII, AGOSTINO, born at Bologna, in 1558, must be mentioned, although he did not work wholly with the graver. He studied his art with his cousin, LODOVICO, and became so skilful as an artist that while engaged in engraving the productions of other artists he was able to correct their designs wherever they happened to be defective. As an engraver he was entitled to rank high, and he was also a most prolific artist. ANNIBALE, the younger brother of Agostino, born in 1560, was scarcely less renowned as an engraver; although he has left fewer specimens of his engraving than his brother, he is said to have been more industrious. Bryan describes no less than twenty plates by this engraver, partly etched and finished with the graver; and specimens are not difficult of attainment by collectors.

ASCANIS GUIDO, an Italian engraver deserves to be mentioned in connection with the plate of the Last Judgment, engraved after Michel Angelo Buonarotti. It is dated 1567. From this time to about the middle of the seventeenth century the name of PASSE frequently occurs in chronological lists of engravers. CRISPYN VAN DE PASSE the elder, was justly celebrated for his engravings: in 1643 he published a drawing-book which

at the time was greatly esteemed. He left his native town of Utrecht and came to England and engraved here for some time previous to 1635, which is the latest date of any of his English plates. Other members of this family whose works are occasionally to be purchased are SIMON and MADELEINE.

Among the many really good engravers who worked from the designs of Rubens, LUCAS VOSTERMAN was conspicuous. Born at Antwerp in 1580, he at first studied painting under Rubens; but at his master's instigation he abandoned this branch of art for that of engraving, as being more suitable to his talents. He worked entirely with the graver, and his prints, which are very numerous, are more characterised as being faithful reproductions of the original paintings from which he worked, than as being remarkable for excessive neatness. Rubens has been credited with good fortune in having so many of his pictures finely engraved; but the instance now under notice seems as much to point to the judgment of the artist in selecting and directing his engravers. Specimens of this engraver's skill are to be met with at so low a price as to be within the reach of the most modest collector.

The plates of CORNELIUS BLOEMART (born at Utrecht in 1603) were executed with the graver alone, and are greatly and deservedly admired, although the few specimens that occasionally come into the market do not appear, except in rare examples, to fetch high prices. He has the reputation of having been one of the earliest engravers who attempted, by a gradual toning down of distant objects in his designs, to give greater prominence to the more important parts of his

subjects in the foreground. His work is noticeable also for considerable neatness.

In this same century the name of WENCESLAUS HOLLAR occurs, of whom M. Duplessis affirms "that he is the only German engraver in this century who deserves to be mentioned,—he excelled in rendering the transparency of glass, the lustre of metals, the softness of the hair or feathers of animals, and the silkiness of cloth." Upon reference to a modern "Catalogue of Engravings by the First Masters," no less than fifty-one specimens are offered, ranging from five shillings to two and a half guineas.

PAUL PONTIUS, who was a pupil of Vosterman, achieved notoriety as a Flemish engraver, occupying himself principally with reproducing the works of Rubens and Vandyck, in each of which he appears to have been equally successful. His plates are mostly portraits done with the graver, and specimens are priced at from ten to thirty-five shillings.

"The pictures of Le Brun, under the graver of Edelinck and Gerard Andrau, appear to have been the works of an accomplished colourist, and assume perfections in which they were really deficient." Such are the commendatory terms in which Bryan introduces the name of GERARD EDELINCK, who although a German by birth, having been born at Antwerp in 1627, spent the most important and productive part of his life in Paris. There can be no question that his plates, which were executed with the graver alone, are deserving of Bryan's encomium, and judging from the number of plates which he finished, he must also be credited with considerable industry. Specimens are to be obtained of the dealers at small outlay.

Another engraver noticeable for the large number of works which he accomplished was ISRAEL SILVESTRE, born at Nancy, in Lorraine, 1661. His works were principally landscapes, views of buildings, and Royal processions. The most extensive work from his hand was "The Grand Carousal, or Royal Entertainment at Paris, 1662," consisting of 108 prints; although it is asserted that some of these had been executed by other engravers.

FRANCIS POILLY, son of a goldsmith at Abbeville, born in 1622, adopted the neat and finished style of Bloemart. His works, which were numerous, were entirely executed with the graver, and may be occasionally met with at the dealers. He was succeeded by his disciple, NICHOLAS PITAU (Antwerp, 1633), who surpassed his master in the vigorous character of his work.

Many of the old engravers devoted themselves almost exclusively to the engraving of portraits,—and indeed in this respect they have had not a few imitators among the moderns. Among these PETER DREVET the younger (Paris, 1697,) is worthy of notice. Bryan speaks thus highly of his work,—“His celebrated portrait of Bossuet may be considered one of the finest specimens of that style of engraving;” and the trade value of his prints may be judged from the plate “Adrienne le Couvrer, after Coypel,” being catalogued at 50s. Another engraver whose works are but little, if at all, inferior to Drevet, was JACOB HOUBRAKEN (Dort, 1698), who also engraved a considerable number of portraits. Both these artists worked with the graver alone, as also did GIRARD ANDRAU (born at Lyons in 1640), who is described by

Strutt as "the greatest engraver, without any exception, that ever existed, in the historical line." There were also other members of the family of Andrau more or less famous, but Girard, or Gerard, is the most celebrated. Upon his return to Paris, after an absence of some considerable time, Gerard was appointed engraver to the king, with a handsome pension and residence in the Gobelins. He was very successful in his engravings after the pictures of Le Brun.

It will be well to bear in mind that impressions of plates by the old masters have often acquired a monetary value from considerations altogether apart from their merits as works of art; but the collector who is judicious, and not absolutely reckless as to expenditure, will do well to avoid those high-priced rarities which, after all, possess merely a factitious value.

Mr. Gilpin gives the following particulars, which may serve the purpose of a warning at the same time that they are amusing:—

"Le Clerc, in his print of Alexander's Triumph, has given a profile of that prince. This print was shown to the Duke of Orleans, who was pleased with it on the whole, but justly enough objected to the side face. The obsequious artist erased it and engraved a full one. A few impressions had been taken from the plate in its first state, which sell among the curious for ten times the price of the impressions taken after the face was altered. Callot, once pleased with a little plate of his own etching, made a hole in it, through which he drew a ribbon and wore it at his button. The impressions after the hole was made are very scarce and amazingly valuable. In a print of the Holy Family, from Vandyke, St. John was represented laying his hand upon the Virgin's shoulder. Before the print was published, the artist showed it among his critical friends, some of whom thought the action of St. John too familiar. The painter was convinced, and removed the hand; but he was mistaken when he thought he added value to his print by the alteration. The few impressions which got abroad with the hand upon the shoulder would buy up all the rest three times over in any auction in London."

A similar story is told of the celebrated etching by Rembrandt of a little dog, a special print of which realised £61, and now forms part of the valuable collection in the British Museum, having been acquired at a cost of £120. Time only adds to the commercial value of such curiosities, and it is believed that this print, if now offered to competition, would fetch probably double the amount last paid for it.

In Dr. Willshire's "*Introduction to the Study and Collection of Early Prints*," 1877, a representative list of Engravers is given divided into countries, which may usefully be here reproduced:

THE NORTHERN SCHOOLS.

The masters of 1446, 1451, 1457, and 1464. E. S. 1466. The master of "The Garden of Love," the master of the School of Van Eyck, or of 1480. The master of "Boccaccio."

GERMANY.

Martin Schongauer, Israel van Meckenem, Albrecht Dürer, Ludwig Krug, Aldegrever, Altdorfer, the Behams, Binck, Pencz, the Hopfers, Virgil Solis.

HOLLAND.

Lukas van Leyden, Dirk van Staren, Cornelius Matsys, Lambert Suavius, the De Bryes, the Brothers Wierix.

FLANDERS.

Goltzius, J. Matham, Saenredam, Jacob de Gheyn, the Sadelers, Scheltius & Boetius de Bolswert, the Bloemarts, the Vostermans, the Visschers, Paul Pontius, Houbraken, De Goudt.

FRANCE.

The Lyons Master of 1488, Duvet, Cousin, Garnier, the School of Fontainebleau, the De Laulnes, Callot, Mellan, Morin, Nanteuil, Edelinck, Masson, the Drevets.

ENGLAND.

Geminus, the De Passes, Elstracke, R. Payne, Delaram, the Hogenbergs, Hollar, Droseshout, W. Fairthorne, Marshall, Gaywood, Cecil, Logan, White, Ravenet, Grignion, Dorigny.

SOUTHERN SCHOOLS.

Nielli and the Niellatori, Finiquerra, Perigrino.

The Florentine burinists, Baldini, Botticelli, Pollajuolo, Filippo Lippi, Verocchio, Gherardo, Antonio da Giunta, Robetta.

The Venetian, Paduan, Lombardian, Mantuan workers and others of Central Italy, as Andrea Mantegna, Zoan Andrea, Nicoletto da Modena, Giov. Andr. da Brescia, Jacopo di Barbarj, Girolamo Moceto, Marcello Fogolino, Pelligrino da Udine, Benedetto Montagna, the Campagnolas, Leonardo da Vinci.

Roman School and Marco Antonio Raimondi, Agostino di Musi, Marco Dente da Ravenna, Caraglio, the Master of the Die, Bonasone, Enea Vico, the Ghisis.



PRACTICAL DIRECTIONS FOR PLATE
ENGRAVING.

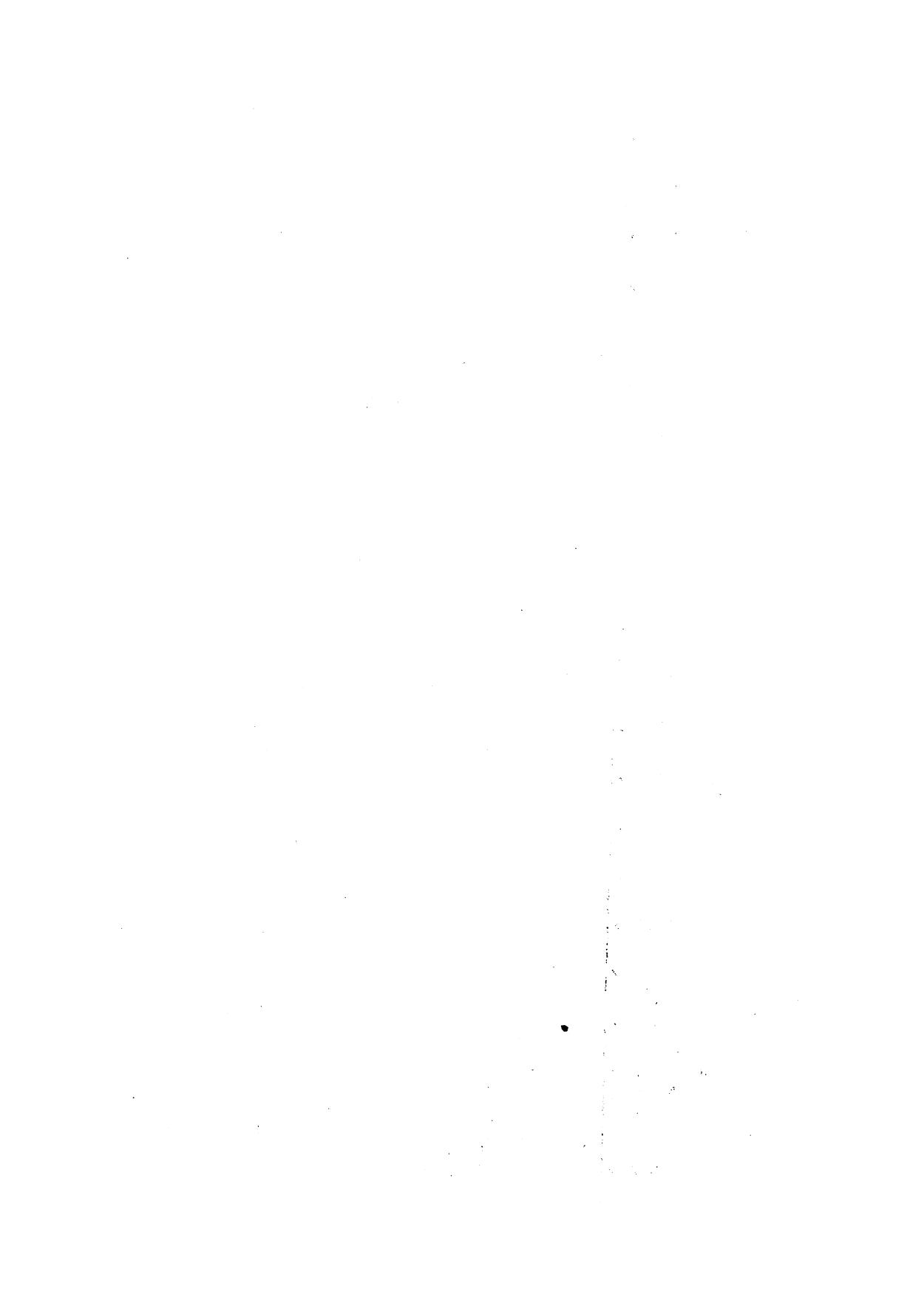
LINE ENGRAVING.—In this, as in many other matters, the best instruction is that to be derived from witnessing the various operations actually performed by an adept; but in default of this the following practical and simple directions may be found useful:—

The engraver places the plate on a table or bench before him, resting it upon a leather cushion, which affords resistance to the pressure of the hand while engraving, at the same time that it gives facility for turning the plate about so as to obtain the most eligible direction for employing the graver. The plate is held and kept firm with the left hand, while the graver is



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supported and propelled with the right. The lines are cut in the plate by pushing the graver forward—away from the operator. As the lines to be cut in the metal are often necessarily fine, the engraver has to accustom himself to the use of an eye-glass of rather considerable magnifying power, which is kept in its position by a cord passing round the head.

The effects in line engraving are obtained from the varying thicknesses of the lines employed; great attention should, therefore, be paid to this part of the engraver's work, by selecting gravers more or less fine in the point, as may be required for the particular work in hand. Lines intended to appear black and heavy in printing should not only be broad, but should also be cut deeper than the fine ones, so as to hold greater quantities of ink,—as the shadows in line engraving cannot be produced by leaving solid pieces of the plate, as is done in wood engraving. By reason of the ink being only held in the cavities made by the graver, the artist has to produce his heaviest shadows by lines crossing each other, and this may be done by the lines being engraved, if necessary, to cross in several directions.

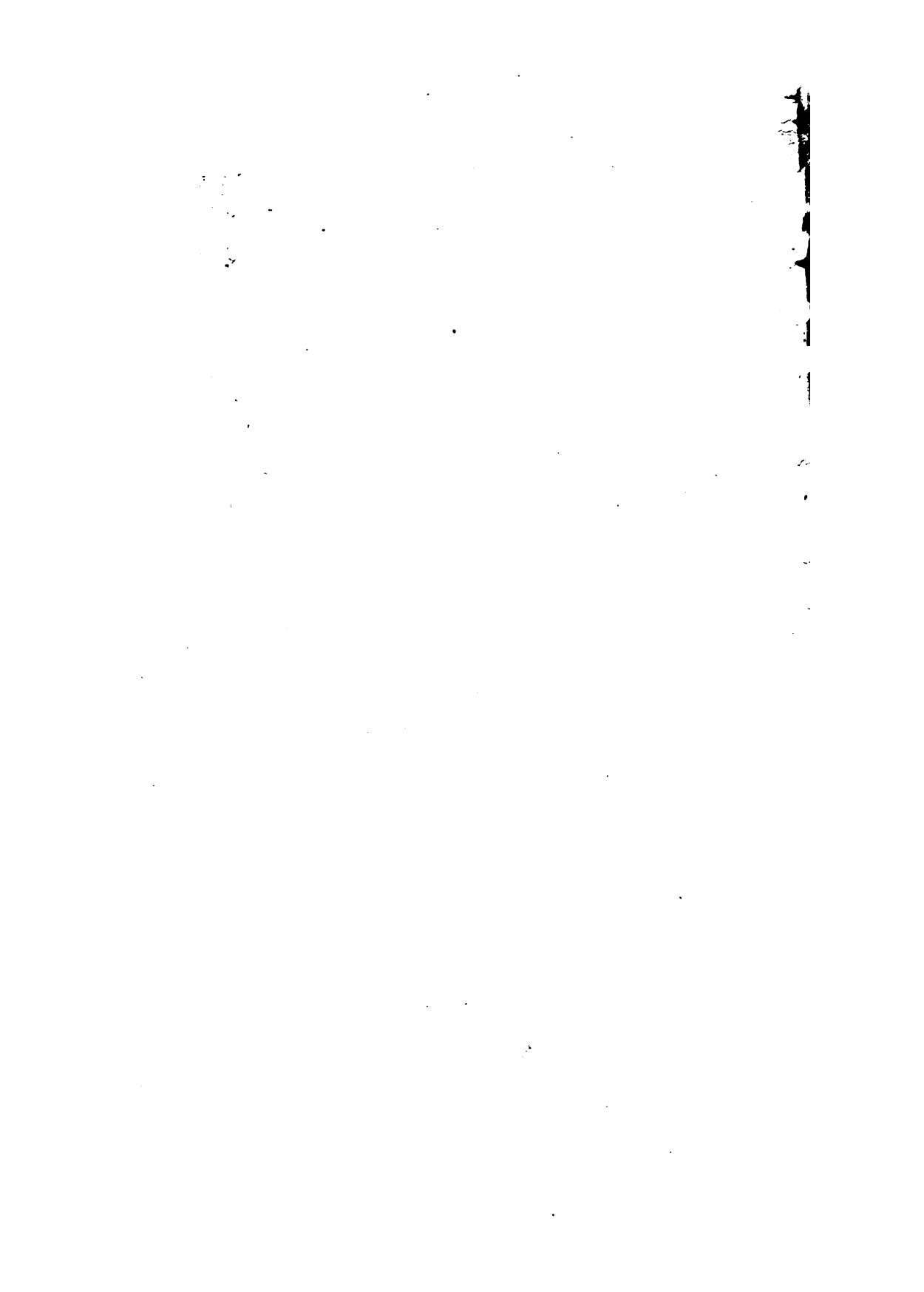
When a line has been engraved in error, or by the accident of unsteadiness in the hand, or "slipped" as it is called, it may be rubbed out by burnishing the face, or it may be punched out from the back of the plate. At any stage of the progress of the work a proof may be taken without injury to the completion of the plate. The lettered description of the plate is always left to the last, and "proofs before letters," as they are called, are for this reason highly valued as indicating a fresh and perfect condition of the plate.

Although the practical details of the various descriptions of engraving are treated separately, yet the directions necessary to be observed in each, contain many things which are common to all. The student should, therefore, not content himself with perusing the particulars of the special form of the art which may be the subject of his immediate attention, but should study the subject of engraving in its entirety. By this means he will attain a perfect knowledge of the subject and will be saved the disappointment of missing some points, equally important in theory and practice, which might otherwise escape him. For instance, a knowledge of etching is almost as essential to the line engraver as are the particulars of the use of the graver; because plates finished in the line method and properly designated line engravings, are often commenced by a slight etching of the subject. In the early part of this chapter mention is made of a few of the Old Masters who practised the two descriptions of engraving in combination.

The subject of ETCHING is considered so important, from the popularity which it has attained and from the increasing attention now paid to it, that a section of this chapter has been specially devoted to it, in order that the subject may be more fully treated, both historically and practically. It will be sufficient here to mention that in etching, the plate is covered with a resinous "ground" through which the artist draws his picture. When the plate is finished by the artist, it is placed in a bath of acid until the lines left on the surface of the plate are bitten to a depth sufficient for printing purposes.



*The Wye near Goodrich Castle,
at the King's Ferry.*







Michael Faraday.

From a Photograph by John Watkins, 36, Parliament Street.

In **STIPPLING**, the engraver uses a series of dots of various sizes, which are substituted for the continuous strokes employed in line engraving.

This is done with needles for the outline and some parts of the stippling, assisted by a *roulette* or toothed-wheel for the deeply shaded parts. Acid is afterwards applied in the usual way, particular attention being paid to "stopping out" so as to produce as great a variety of tone as possible. Stippling was successfully employed in combination with line engraving by Martin Schongauer and by his pupil Albrecht Dürer.

A modification—or more properly speaking, combination—of stippling and etching resulted in a method which has been called **CHALK ENGRAVING**. This was first attempted by De Marteau, and was introduced into England from Paris by Ryland about the year 1750. The effect of this description of engraving is, as its name implies, to imitate drawings made with crayons and stumped. These two methods of engraving—stippling and chalk engraving—at once became popular; being readily effected, requiring less artistic capability in the performance, and offering the great commercial advantage of enabling the engraver to produce his work at a cheap rate. It is known that the celebrated Bartolozzi adopted this method to a great degree.

AQUATINT may be described as a species of stippling, differing from that method principally in the stipple being irregular in character, and not produced by a series of dots, but by a grain or ground being laid down upon the plate. Aquatint was invented, or discovered, by the Abbé St. Non, and by him communicated to Le Prince. It is believed that Le Prince, in practising this description of engraving, produced his grain by

sifting powdered resin upon the plate and afterwards applying heat to fix it. When the art was introduced into England by Mr. Paul Sandby, he improved upon the method previously adopted, by applying the resin in solution with highly rectified spirit. The grain was produced by flooding the plate with the compound, and, upon the spirit evaporating, the resin was found to adhere to the plate in small nodules.

The ground being prepared, the etching of the subject is then to be made in the usual way. The surface of the plate being partially protected by the particles of resin, the acid acts around and between them, thus giving a granulated appearance to the surface of the plate when ready for printing. Considerable variety may be effected by the comparative fineness or coarseness of the grain. The result produced in the impressions bears a very close resemblance to drawings in Indian ink, particularly if the colour or tone of the ink be judiciously selected. It is said that the early productions of Le Prince were actually sold as original drawings, so close was the resemblance.

There is an analogous description of Aquatint used in the production of relief blocks, which, in its production, resembles in some important respects the original form of aquatint here mentioned; the reader is referred to the chapter on "Engraving by Chemical or Mechanical Processes" for details.

MEZZOTINT.—This style of Engraving, which is more especially adapted for large pictures, and particularly for portraits, has been considered to be of English origin, or as essentially English in character. For this reason it has been styled "*Manière*

Anglaise." It cannot be said to boast of a very great antiquity, 1640-42 being considered the time of its introduction.

This method of engraving differs considerably both from line engraving and from etching. Like etching, however, a "ground" is necessary, but it is produced in a very different manner. The mezzotint ground is the result of the passing over the smooth surface of the copper or steel plate a peculiar instrument called a "*berceau*," or cradle, or rocking tool. The rocking action of this tool cuts up the face of the plate into minute burrs, so that when the ground has been laid, if an impression of the plate were to be taken, it would show a completely and evenly blackened surface. In laying this ground, produced by the frequent "rocking" of this "*berceau*," or cradle, over the surface of the plate, the object desired is to create a perfectly uniform softness. This is work that may safely be intrusted to an assistant, indeed plates can now be purchased with the ground already laid, this ground being produced by machinery.

The plate being ready for the engraver, the following method of commencing the work may be adopted:—"The plate is rubbed with a rag which has been dipped in black chalk powder, or is smoked over a burning wax taper, as it is frequently in the process of etching. The back of the design, previously covered with a mixture of powdered red chalk and flake white, is then laid on the plate, and the outline of the design is traced over with a blunt point, the result being that the red particles on the back of the design are transferred to the black ground of the plate under the influence of the pressure."

The ground being laid and the design transferred, the engraver, by means of a scraper, rubs or scrapes down the burr upon the plate, to produce the lighter shades of the picture. All the deep shades of the picture are provided to his hand by the "ground," and his work is to remove this ground wherever lighter parts are required. A burnisher is used, where in the original picture brilliant lights have been indicated by the painter's brush. The mezzotint engraver finds it desirable to take frequent proofs of his work, that he may ascertain whether it be progressing satisfactorily. Where the burr has been scraped away too much, fresh cradling has to be resorted to.

In subjects of a complicated character, where in the original painting the canvas is crowded with figures or with minute detail, mezzotint is obviously not admissible; but for portraits—boldness of design or effect being the characteristic of the picture, this method of engraving is without rival. In particular, the softness with which it is capable of reproducing flesh tints and the folds of drapery is unequalled by any other description of engraving. The first, in England, to make use of steel plates for mezzotint engraving was the late Mr. T. G. Lupton, for which he received the Isis Gold Medal of the Society of Arts in 1822.

The list of representative mezzotint engravers given by Dr. Willshire includes the following:—

"Ludwig Siegen von Sechten, Prince Rupert, Sir Christopher Wren, Thomas of Ypres, Fürstenberg von Eltz. — The Vaillants, the Van Somers, the Verkoljes, Gole, Valck, Blooteling. — J. Evelyn, F. Place, Sir R. Cole, Sherwin, Luttrell, R. Thompson, Beckett, Alex. Browne, E. Cooper, R. White, Johnson, Lumley, W. Fairthorne, jun., J. Smith, G. White, the Fabers, Simon Le Blon and followers."

ETCHING.

THE style of engraving most popular at the present day is undoubtedly that which is designated etching; and for this reason, among others, that an artist capable of drawing in pen-and-ink may soon acquire the ability to etch and produce multiplied impressions of his own designs. An engraver is usually occupied with reproducing on a plate the picture of a painter, while the skilful etcher works from his own designs. An etching is produced by drawing the subject or design upon a properly prepared copper or zinc plate, with an instrument of steel called an etching-point or needle. Anything that will scratch through the etching-ground with which the plate is covered will serve for an etching-needle; but professed etchers generally use a bar of steel shaped like a pencil sharpened to a point. Mr. Hamerton, who is known as an authority upon the subject, recommends the use of a point which has been invented by Mr. Dawson for the purposes of his special typographic etching.

In giving a practical description of the process of etching, the first thing to be done is to lay a "ground" or surface upon the polished plate, by rubbing upon it a composition of Burgundy pitch and asphaltum, and wax. The plate should be slightly heated while laying this ground, which is equalised over the plate by dabbing with a ball made of wool covered with silk, and the plate being allowed to cool. The composition or ground is then smoked by being held over the flame of wax tapers until a uniform black glossy surface is produced upon the plate. The drawing to be etched may be sketched in rough outline in pencil upon paper,

and the paper laid face downwards upon the ground. A little pressure will be sufficient to leave the outline upon the ground, which will be a guide in using the etching-point. The outline of the subject being thus prepared the details are put in with the needle, and the drawing is thus completed. It will be seen that etching affords the means of reproducing drawings, designs, paintings, or engravings; but the most important value of etching is its applicability to original work. The best etchers make their drawings upon the copper direct, without any previously made sketch. Indeed, Mr. Seymour Haden, who may be considered to be at the head of the present race of etchers in this country, frequently etches his plates "in the bath," or, as it is termed, on the "continuous method," particulars of which will hereafter be given.

There is reason to believe that the old masters often produced their effects with one "biting" or application of the acid, and that whatever gradation of colour in their pictures was desired was produced by variety of substance in the lines,—thin or thick lines being made use of as required. Any touches that might afterwards be thought desirable were made with a "dry point." When, however, a second biting was determined upon, "stopping out" was resorted to, which was effected by the application of an acid-resister or varnish, applied with a brush to the parts of the plate that were already bitten deeply enough. These parts having been protected, the plate was again submitted to the action of the acid, the effect of which was thus confined to the lines that required to be strengthened. It must be borne in mind that a

mild state of the atmosphere assists, and a frigid state retards the biting. When sufficiently bitten the acid is poured off, the wax removed, and the remains of the etching ground washed off with spirits of turpentine. In recent times the old arrangement of building a wall of wax round the edges of the plate, for the purpose of confining the acid to the face of the plate, has been discarded. It was at best a clumsy arrangement it must be confessed, and unless done with considerable care not unfrequently failed to prevent the acid finding its way under the wax wall. It is quite possible, nevertheless, to make use of this old plan occasionally with advantage, wherever the subsequent biting has to be confined to a small portion of the plate,—thereby avoiding superfluous stopping out.

Where entirely fresh work has to be put on a plate which has already been bitten, and from which the etching ground has been removed, a fresh ground must be laid; but in this instance it must be of a transparent character, so that the previous work being seen through it, the artist may have a guide for the new work he desires to add.

The safest plan, and the one most frequently used, even by experts, is to submit the plate to several bitings; cleaning the plate and taking proofs after each biting, and laying a fresh ground for the succeeding immersion in the bath. In this arrangement the first operation will be to put in the strong lines with a rather coarse needle; at the second operation the next gradation of lines will be added with a medium needle; and at the third the more delicate portions will be drawn with a still finer instrument.

After the first biting, the same blackened ground may be used as at the commencement, because the first lines being thick will be discernible through the ground ; but afterwards a transparent ground must be employed as previously mentioned. Great care, it is manifest, must be exercised in laying these subsequent grounds, as of course the object desired will be altogether frustrated if the ground in the second applications should not effectually protect the lines already etched. Should the work over a plate be unequal in character, the old-fashioned plan of the wax wall may be resorted to, as the action of the acid is thus confined to isolated parts of the drawing.

Somewhat unnecessary prominence has been given to a theory advanced by a celebrated French etcher, M. Lalanne, as to keeping lines apart that require to be deeply bitten. It does not need a very extensive experience to ascertain that lines to be deeply bitten will, to a great degree, be liable to be bitten laterally as well. Lines not requiring such great depth may of course be placed closer together. Besides, if drawn too closely, there is a tendency in the lines to run into each other when heavily operated upon in the bath.

The object of the old-fashioned plan of the wall of wax was, as already stated, to confine the action of the acid to the face of the plate; but the modern procedure is to cover the underside of the plate with brunswick black or varnish, and then the plate can be safely placed in a shallow bath of acid. This has also another advantage in giving the operator an opportunity of imparting a rocking motion to the bath, which is also found to be almost essential to success in typ-



and the deer which may be used as the deer have been shot and the general information given the employ of man.

manfully, could be considered grounds, as it would be altogether unnatural as well as applications should never be already stated. Since the unequal in character, the wall may be raised so that it is thus confined by another.

Somewhat similar to a theory advanced by M. Latreille, with respect to the example above, is that the experience of many years will, as a great means for protection as well. There has, however, of course, the point which, among other things, is to be done, the fence must, when built,

The object of the construction of such wall, as already named, the aim to the deer is to provide to cover the animal hemispherical block or mound, so safely placed in a sheltered hollow, other advantages to give the animal of occupying a working out of the hole, also found to be almost immo-



"Men must work and women must weep"

After this first "towing," the wall may be used as on the river bank being dried and the ground, but otherwise it must be employed in its natural state. It must, most be continuous along the grounds, so as to assist the water, altogether inundated, in the gradual applications should you be so far already etched. Should the soil be unequal in character, the design was well may be retarded by such a condition.

Somewhat similar to the above is a theory advanced by M. Lutetius, as to keeping trees in their dredge boats. He also has had experience in growing trees upon them, and will, no doubt, suggest that they may be placed upon the walls. These are, however, of course to be placed about the trees, and when there is enough room, and other wise convenient.

The object of the author of this note was, as already said, to cover the soil to the face of the trees. The procedure is to cover the Brunswick block or similar, probably placed in a shallow basin, another advantage in giving this a basin, of inquiring a rolling motion, which is also found to be almost certain.



"Men must work and women must weep"



"Men must work and women must weep"

etching, hereafter to be explained. This rocking motion effectually prevents the deposit upon the plate of any copper held in solution in the bath.

The "continuous method" of etching, introduced by Mr. Seymour Haden, is actually drawing while the plate is in the bath. The prepared plate is put into a specially constructed bath, which is an ingenious combination of bath and drawing board, and the artist commences his drawing by employing himself first upon those lines which are destined to receive the greatest amount of biting, the fine lines being left to the last. The biting proceeds simultaneously with the drawing, and the picture may thus be completed at a single sitting.

This process, notwithstanding the rapidity with which a plate may be finished, seems calculated to encumber a young artist with additional and unnecessary difficulties; and, indeed, it will be manifest that it can only be suitable for artists who are very expert with the point. The greatest objection is the annoyance of doing the work subject to the constant inhalation of the unpleasant fumes generated by the action of the acid. That the continuous method will ever come into general use may be doubted; and Mr. Hamerton, although he recommends a "positive process" of his own, confirms the opinion of its restricted use. When the artist adopts the old *negative* process, he makes his mark with the point through the ground, and the effect produced is a shining line upon a black ground; hence the name of negative given to the method. On the contrary, the *positive* process gives a black line on a white ground, just as in drawing with lead pencil upon white paper. This reversal of effect produced

in the work of the artist is apt to mislead any one who has not had experience in etching; and considerable practice is necessary to accustom the eye to appreciate the effect which will result when the plate is printed. For the positive process, the plate is silvered, and pure white wax is used for the ground; the plate is drawn *in* the bath, and as fast as the lines are made with the needle the action of the acid turns them black.

The mordant to be used in the positive process is the Dutch mordant, and is made by dissolving chlorate of potash in boiling water, and adding hydrochloric acid, previously mixed in cold water, in the following proportions:—

	For Copper.		For Zinc.
Hydrochloric Acid	20 parts.	Hydrochloric Acid	10 parts.
Chlorate of Potash	3 „	Chlorate of Potash	2 „
Water	<u>77 „</u>	Water	<u>88 „</u>
	<u>100</u>		<u>100</u>

“Opinions differ,” says Mr. Haden, “as to what is the best metal upon which to etch. Steel is never used by etchers; it is entirely an engraver’s material. Copper is generally used, but I prefer zinc. Copper is sometimes soft, sometimes hard, and this very materially affects the execution, the biting-in, and the endurance of a plate. An etching on copper is, perhaps, more delicate and refined, but one on zinc gives a more painter-like and artistic impression, is richer in colour, and is bolder and bigger; it has besides the advantage of being more easily bitten.”

As to the mordant, although any kind of acid that will bite may be used, different etchers have each their special material with which they work. Mr. Haden,

in addition to the formula given above, also uses the following:—

	For Copper.		For Zinc.
Nitrous Acid ...	$33\frac{1}{3}$ parts.	Nitric Acid ...	25 parts.
Water ...	$66\frac{2}{3}$,,	Water ...	75 ,,
	<hr/> 100		<hr/> 100

“Soft ground etching” merely gives effects which can be more readily obtained by lithography. For the materials for this soft ground “take a ball of ordinary etching ground, mix with it an equal quantity of tallow, heating both and stirring until perfectly mixed. In hot weather use less tallow, in cold weather use more. Make balls of this mixture and enclose them in a bag of taffetas silk.” Lay this ground in the customary way and smoke it. Upon a sheet of paper laid upon the plate the subject is drawn with pencil, and upon removing the paper the wax will be found to adhere to such parts of the paper as the pencil has traversed, thus leaving the plate bare in the lines that have been drawn for the action of the acid. By this process pencil-drawings may be closely imitated.

The student, as well as the collector, may be referred with advantage to Mr. Hamerton’s work on *Etching and Etchers* for some valuable hints and advice, and from this work the following is quoted:—“The strong points of etching are its great freedom, precision, and power. Its weak points may be reduced to a single head. The accurate subdivision of delicate tones,—or in two words, perfect tonality is very difficult in etching; so that perfect modelling is very rare in the art, and the true representation of skies, which depends upon the most delicate discrimination of their values, still rarer.”

In making some historical allusion to the early masters it may be stated that when etching was first introduced, engravers, fearful of trusting entirely to the new style, combined the use of the graver with that of the etching-point. The point, indeed, was used by painters as well as by engravers; but the painters naturally confined themselves exclusively to the point, perfectly satisfied with the results obtainable and with the freedom with which their designs could thus be reproduced. Engravers, on the other hand, having their exertions concentrated upon the best methods of reproducing the original pictures upon which they worked, were necessarily led to use all the varied means at their command. Their responsibility, of course, was limited to the faithfulness of the reproduction, and they, therefore, availed themselves both of etching and engraving in the same work, often to the manifest advantage of the engraved picture.

Although etching is now recognized as giving the artist greater facilities of manipulation as compared with line engraving, yet it would not be unreasonable to believe that this advantage was not observable in the early attempts at exercising this method of engraving. The artists who were among the first to practise etching were of course unskilled in the use of engravers' tools, while the engravers who had acquired reputation in their art were possibly averse to the introduction of a method that appeared to put engraving within the reach of every painter. The year 1496 is given as the earliest date when etching was employed upon a plate, but the first plate wholly etched must have been of still later date.

FRANCESCO MAZZUOLI, generally designated IL PARMIGIANO, who was born at Parma in 1503, has the reputation of being the first artist in Italy who made use of the point alone, but his etchings are described as scratchy and imperfectly bitten. On the other hand even the few etchings by ALBRECHT DÜRER show a fearlessness and vigour in the use of the materials which are very marked.

The year 1516 has generally been considered the earliest date of any work entirely engraved by etching; while, on the other hand, 1512 has been given as the date of Dürer's etching of the picture of St. Jerome, and it is affirmed that he also attempted in about the year 1514 etching upon "iron or steel." Dr. Thausing, indeed, goes so far as to credit Dürer with being the inventor or discoverer of etching. Strutt mentions GIRARD AUDRAN (born at Lyons in 1640) as the first successfully to combine the use of the point with that of the graver; but JONAS SUYDERHOEF, who was born at Leydon about the year 1600, is a better as well as an earlier example. Dürer's use of etching in the early stage of line engraving must, however, claim priority.

At the threshold of any inquiry into the history of etching, the attention of the student will naturally be arrested by the name of REMBRANDT, and this not entirely on account of the great number of works by this artist which are to be met with. The masterly and free handling of the point which is so observable, and the brilliant effects produced, have always rendered his plates objects of admiration. Fair impressions of Rembrandt's etchings are not by any means scarce, and although there are some which, from various causes, command a high price, the collector can indulge in the

temptation of possessing one or more specimens without any very great tax upon his purse. Rembrandt is especially noticeable for the portraits executed by him, which are among his best works.

The early etchers were apparently more assiduous in their efforts to produce effect in their plates than solicitous for neatness of execution; and this is particularly to be noticed in the etchings by VAN DVCK. Vigour and firmness, rather than minuteness of detail, are the characteristics of this master's style.

Both ADRIAN VAN OSTADE and BEGA were among the more skilful of the Dutch masters. Neither of these etchers, however, seemed to have had any elevated notions of the capabilities of their art beyond the faithful representations of peasant life. PAUL POTTER, on the other hand, had the capability of investing the rude materials of his rural subjects with a certain dignity and power.

Among etchers of landscapes the style of JACOB RUYSDAEL is characterised by considerable freedom and firmness, and impressions of his plates are much sought after by collectors.

For many reasons the name of JACQUES CALLOT stands out prominently as a representative of French art. This ingenious designer and admirable engraver was born at Nancy, in Lorraine, in 1593, and although by birth a Frenchman, he derived his knowledge of the art which he so industriously and successfully followed, from Rome. Bryan informs us "that he studied engraving under Philip Tomasin, but not meeting with much success in his efforts with the graver he applied himself to etching." Without vouching for the accuracy of this statement it may be confidently asserted that he was a

most industrious worker. M. Heinecken, in his *Dictionnaire des Artistes*, puts the number of plates engraved by this artist at "upwards of fifteen hundred." Specimens are procurable at the dealers at moderate prices.

The family of STELLA is known to collectors as celebrated for the number of painters and engravers which it gave to the world. JACQUES STELLA (Lyons, 1596) was a painter and also occasionally employed himself in etching, as did also his nephew ANTOINE BOUSONNET STELLA. The most renowned of the family as etchers were, however, the two sisters CLAUDINE and ANTOINETTE BOUSONNET, both natives of Lyons. Claudine is famous for her plates after the pictures of her uncle and of Nicolas Poussin, and it has been said that "no artist has been so successful" in engravings after the last-named painter.

GIOVANNI FRANCESCO GRIMALDI, better known as IL BOLOGNESE, from the place of his birth, is celebrated as an engraver with the point, his etchings being both considerable in number and excellent in character. He is also renowned among painters for having been employed by Cardinal Mazarine and Louis XIV., and as being the subject of the following anecdote, indicating his amiability and disinterested generosity, which is thus given by Bryan:—"A Sicilian nobleman, who had been obliged to fly from Messina during the troubles in that country, had taken refuge at Rome, with his daughter, and was reduced to a state of the greatest indigence and distress. Their wretched habitation happened to be precisely opposite the residence of Grimaldi, and it was not long before he became acquainted with their story and their deplorable situation. Desirous of affording relief, without wounding

the feelings of the illustrious sufferers, he approached their door under the darkness of evening, and knocking gently, as soon as it was opened, threw in a purse of money, and retired undiscovered. This humane stratagem had been repeated more than once, when the Sicilian, resolved to find out his mysterious benefactor, concealed himself near the door, and on his approach, rushed into his arms and fell at his feet, expressing his gratitude and admiration. Grimaldi brought the strangers to his house, and lived in the closest friendship with them till his death."

STEFANO DELLA BELLA (Florence, 1610) studied under Canta Gallina, who was also the master of Callot. One authority says "no artist has handled the point with more facility and finish," while another speaks of "his execution as admirable, and his touch spirited and picturesque." Specimens of this artist's plates are frequently to be met with at moderate prices.

One of the most important names in the list of the old masters of etching is that of WENZEL HOLLAR, who spent a considerable part of his active life in England and died in London, in 1677, under circumstances of great privation and poverty. He was born at Prag, in 1607, his family at the time being in affluent circumstances. When he was only twelve years of age, however, he had to apply himself to drawing and engraving as a means of subsistence, the outbreak of war having completely ruined his family. He received instruction in etching from Matthew Merian, at Frankfort. Hollar subsequently came to London, under the protection of the Earl of Arundel. He was a most industrious artist; between two and three thousand plates having been attributed to him,

examples of which can be readily obtained at the dealers. All the authorities on the subject make mention of Hollar's works ; thus Dr. Willshire says, "In the line of mechanical execution this master is so fine that a collection should no more be without examples of his work than it should want Dürer's, Rembrandt's, and Marc Antonio's." Mr. Hamerton, however, speaks disparagingly of Hollar's etchings, by saying that they are not to be compared to his work with the burin ; an opinion which is not shared by other authorities. The Rev. Joseph Maberly, in "*The Print Collector*," is hardly more enthusiastic in his admiration. "Now Hollar is an artist," says he, "of the seventeenth century, ranking in the English school from having chiefly practised in this country, of very superlative mechanical skill, a most faithful delineator of what was placed before him ; but that is all. He displays none of the higher qualities of his art—invention, imagination, composition, chiaro-oscuro effect." These last mentioned writers, it is submitted, scarcely do justice to this artist, and a reference to the works which he has left it is believed quite justifies the opinion that he was "one of the greatest old etchers." He was a singularly unfortunate man, for besides the troubles of his early days previously mentioned, he was in London during the lamentable period of the plague and the great fire, when, of course, all artistic employment was out of the question.

Hollar produced work in almost every branch of the art, but his principal subjects were portraits—many from the Arundel collection—and views of places and public buildings.

The representative list of etchers given by Dr. Willshire is as follows :—

NORTHERN SCHOOL.

Rembrandt, Van Dyck, Bol, Van Vliet, Livens.
Ostade, Teniers, Bega, Dusart.
P. Potter, Berchem, Karel du Jardin, Van de Velde, Roos,
Stoop, De Laer, De Bye.
Claude, Both, Swanenelt, Waterloo, Ruysdael, Everdingen,
Weirotter.
Zeeman, Bakhtizen.

SOUTHERN SCHOOL.

Parmigiano, Meldolla, Annibale, Caracci, Guido Reni, Cantarini,
Scarsello, the Siranis, Della Bella, Castiglioni, Canaletto.

Of late years etching has experienced a revival both in France and in England. In France, this may be said to be due to the genius and exertions of LEOPOLD FLAMENG as an artist, with the co-operation of M. ALFRED CADART, a publisher. M. Cadart has devoted himself almost exclusively to the publication of etchings, and he it was who founded the *Société des Aquafortistes*. FLAMENG was born in 1831 and first exhibited in 1855. He has exercised considerable influence in his art, particularly in connection with the *Gazette des Beaux Arts*, which from its commencement he has assisted to illustrate. CHARLES JACQUE and DAUBIGNY are names that should also be mentioned here.

The name of the talented but truly unfortunate CHARLES MÉRYON cannot be overlooked where mention is made of the revival of etching in France. Born in Paris in 1821 he inherited from his mother a pre-disposition to insanity,—a malady which, commencing in eccentricity, developed eventually into a morbid persistence in refusing food. Twice was he the inmate of a lunatic asylum, in which place indeed he ended his lamentable career in 1868. He began the serious business of life as a sailor, and while

following this occupation he, at an early period, shewed his predilection for the graphic arts by many very successful attempts at modelling and drawing. During this period of his career a story is told of his making a navigable boat under circumstances of great disadvantage and severe personal labour. The captain of the ship having prohibited the use of his boat, Méryon showed at once his high spirit and his indomitable perseverance by making one with his own hands for himself. After leaving the sea, Méryon turned his attention to that art which was destined to develop his talent, but which did not lead him on to fortune. He studied etching under M. Eugène Bléry, and appears to have worked industriously, notwithstanding the want of appreciation and consequent poverty which he experienced. Méryon, upon several occasions, sent his productions to the galleries for exhibition, but his pictures did not attract any attention, and no medal ever rewarded his ambition: indeed, two of his now celebrated pictures—*La Galerie de Notre Dame* and *Rue des Toiles*—were positively rejected. His most important work, *Eaux fortes sur Paris*, dated 1852 to 1854, consisting of twelve plates, did not sell, and, after taking a few impressions himself, he destroyed the plates. One peculiarity of his method of work has been noticed; instead of working from the top of the plate downwards, it was his practice to proceed in the opposite direction, alleging as his reason that it was more sensible to begin building from the foundation upwards.

Méryon's fate is not by any means a solitary instance of posthumous fame, although it must be acknowledged to be a very remarkable one. During

his life his pictures were hardly thought good enough to be shewn at the galleries; not very long after his death they were so highly esteemed as to be the subject of an exclusive exhibition! The very pictures that, when first published, could scarcely meet with purchasers at all, are now studied and admired by the first etchers of the day. Thus, Mr. Seymour Hayden, speaking of two of his Paris pictures—*L'Abside de Notre Dame* and *La Morgue*—says, “From both these plates it may be inferred that his work was not impulsive and spontaneous, like etchers' work in general, but reflective and constructive, slow and laborious.”

Etchers but rarely attempt to portray skies in their pictures, and it should be noticed that a fine instance of success in dealing with the difficulties of clouding is to be found in one of the pictures just mentioned, *L'Abside*. The Pictures of Old Paris, besides the reproduction of some old drawings, contain several original pictures of Méryon's, which completely establish that reputation which he was unfortunately destined not to live to enjoy. In the short life of Méryon by Mr. F. Wedmore it is stated that some eighteen or twenty pictures produced between the years 1850 and 1854 are among his best works. Mons. Niel, who endeavoured to help the unfortunate artist with his patronage, exerted himself to collect a complete set of Méryon's works, but, owing to the destruction of several of the plates by the artist in a fit of dejection consequent upon his want of success, the task of collection was difficult. Many of this artist's plates are, as may be readily supposed, extremely scarce, which circumstance has enhanced their commercial value very considerably.

In England "Etching Clubs" were in existence before the establishment of the *Société des Aquafortistes*, and the first publication by the elder club was a series of illustrations to Goldsmith's "Deserted Village." Probably the most important work by this club has been that published in 1865, with the title of "A Selection of Etchings by the Etching Club." This work includes plates by Seymour Haden, Hook, Redgrave, Horsley, Samuel Palmer, and Creswick.

The latest evidence of the revival of etching is the establishment of the "Society of Painter Etchers," which held its second exhibition in the spring of 1882. The President of the society is Mr. Seymour Haden, Sir William R. Drake the Honorary Secretary, and the list of Fellows includes nearly all the principal etchers in London.

The names of Ruskin and Whistler must not be omitted from the list of modern etchers, both of whom have given connoisseurs considerable opportunities for discussion as to the merits of their respective works.

It is a fact of some significance that the English publication, *The Portfolio*, which may be considered the organ of the world of etchers, and contains some admirable specimens of the art, could not be kept up to its present high standard, were it not, the editor affirms, for the important help of French artists. Not that good etchers in this country are at all wanting, but because English etchers can more advantageously employ their time with the brush than with the point. Now that the art of etching is so greatly increasing in popularity, the English painters may possibly turn their attention to this special branch of art, with advantage both to themselves and the public.

A noticeable feature of the present revival is to be found in the acknowledged fact that etching is attracting attention as the result of a more discriminative appreciation of the advantages of the art. This has shown itself in the reproduction of several pictures on a large scale in pure etching. It is admitted, that in comparison with the ordinary method of engraving, etching is a far more artistic method of work, and gives the opportunity of the operator expressing his individuality in his work, even when engaged merely upon the reproduction of another artist's pictures. Engraving is, by the very nature of the process, of a somewhat mechanical character, and has been reduced to so established a system that there is comparatively but little difference in the character of the work by different engravers. Indeed, the skill of an expert is necessary to enable any one to detect such variations in style as may exist. Pure etching, on the contrary, gives such freedom in the method of manipulation, that if the same painting were to be reproduced by means of etching by two equally good etchers, the difference in the two results would be easily recognized. "An etcher could not, if he would, conceal his *handwriting* upon his plate, even to the eye of the least observant."

Those who are best qualified to offer an opinion upon the subject, prognosticate that the increasing popularity of etching will not prove a mere freak of fashion, but will be lasting in its character. The greater rapidity with which etchings can be accomplished, compared with engraving with the burin, is a very important advantage in favour of etching; and this will have its influence with publishers to the

occasional exclusion of the other mode of engraving. There is no reason, however, to speak of these two descriptions of art as antagonistic, or even competitive, for etching has a positive and distinctive character of its own. In fact, etching may be said to occupy the middle region between painting and line-engraving, partaking of the freedom of the brush with the decisive power and neatness of the burin.

DRY-POINT.—Engraving with the dry point is frequently mentioned, and consists in working with the needle direct upon the plate without an etching ground. The dry-point is mostly used in commencing plates in line engraving as well as in finishing etchings. The dry-point produces very delicate lines, but being mere scratches upon the surface of the plate, the work is soon obliterated after printing any number of copies.

COPPER-PLATE PRINTING.

To bring out all the effects of the artist in printing impressions from a copper or steel plate, considerable skill is required, although to a casual observer it may appear a very simple process.

When once the engraving of the plate is completed, no further preparation is necessary to fit it for the hands of the printer. The impression is given by submitting the plate to pressure from a roller covered with a soft blanket, under which the plate passes. This mechanical part of the printing is simple enough; but the skill of

the operator is principally shewn in inking the plate. The ink is of a thick oleaginous character, and is applied with a rubber, the object being to fill completely the lines of the engraving without unnecessarily wasting the ink upon the surface of the plate. In order to assist the process of working the ink into all the incisions left on the surface of the plate by the engraver's tools, the plate should be kept at a moderate temperature, which will tend to soften the ink as soon as it is applied to the plate. For this purpose a jet of gas is arranged under a trivet or stand, so that while the printer is taking the ink from his slab, the plate may rest over the flame for a few seconds. The lines upon the plate having been completely inked, the plate requires to be cleansed from all superfluous ink that may adhere to its surface. This is first done by wiping it with a piece of coarse canvas, then with a piece of muslin or fine canvas, and finally polishing it with the palm of the hand. The plate then presents a highly polished surface, with all the lines or markings upon the plate charged with ink. The plate has now to be laid upon the bed of the press, face upwards, and upon its face is placed a sheet of paper which has been previously well damped. The printer, by means of the long spokes to the wheel of the press, works the bed of the press until the plate passes completely under the roller previously mentioned. The pressure thus given forces the paper into the incisions in the plate, and takes up the ink on its surface.

The constant friction employed to remove the superfluous ink from the surface of the plate, tends, by almost imperceptible degrees, to wear down the work, and so render the lines of the engraving gradually less deep, until they at last altogether disappear. For this

reason copper plates will yield only a very limited number of *good* impressions, and the earlier ones are consequently highly prized, and command advanced prices. It is usual, in all important works, to print a few copies of the plate before the lettering under the plate has been added—and these “proofs before letters” fetch extra prices. The tendency to deterioration in plates from which any considerable number of impressions has been taken is forcibly pointed out in the interests of collectors, by Mr. Andrew W. Tuer, the author of “Bartolozzi and his Works,” and his observations may with advantage be here reproduced.

“A considerable number of Bartolozzi’s original copper-plates are in existence, and, unfortunately for modern collectors, are still printed from. Those that I have seen—and the same must apply to all—would long ago, if by any other artist, have been sold for old copper, as they are worn down to mere scratches, the impressions, from an artistic point of view, being absolutely worthless. A good old impression is bright and sharp, though exquisitely soft and beautiful, in fact it courts admiration; while a modern reprint is flat and hazy, the finer parts utterly wanting, and bearing a washed-out and altogether unsatisfactory appearance.”

The printing of etchings from plate is, perhaps, the only part of the copper-plate printer’s work that is entitled to rank as, in some measure, artistic employment. After the plate has been inked and polished, as in the ordinary printing, the operator again goes over the plate, putting on fresh ink where necessary to produce the deeper shadows, and wiping the ink off other parts, even to the extent of greyness in the lighter parts of the picture. A good printer of etchings is a skilled craftsman, who occupies a middle position between the mechanical and artistic expert. Not only is the superior printing of etchings a tedious process, but the production of any considerable

number of good copies is, from the very nature of the circumstances, absolutely impossible.

The want of durability in copper has always been felt as a difficulty, and in order to overcome the objection, plates of steel have been substituted for those made of the softer metal, with manifest advantage in this respect. When this change of metal was introduced by the late Mr. Perkins, of London, the steel plate was first rendered soft for the purpose of engraving, and then hardened again when the engraving was completed. It has since been found that this softening of the plate is unnecessary, as the burin, dry-point, scraper, or burnisher, can be used with almost equal facility upon the hardened as upon the softened steel plate. Where, in commerce, large numbers may be required from a copper or steel plate, the plan is frequently adopted of transferring an impression to a lithographic stone, and using lithography as the printing process. By this means an almost indefinite number of impressions may be obtained without any injury to the original plate. It must, however, be understood that the impressions lose by the operation, both in sharpness and clearness.

Another and very important means, has, however, been more recently introduced, and is practised very extensively by Messrs. Bradbury and Wilkinson, which consists in what has been by some erroneously called producing steel-faced electrotypes. Some details of this process are given under the head of "Electrotyping," to which the reader is referred. The commercial value of this process may be gathered from the fact, that the proprietors of a modern fine art publication relying upon copper-plate engraving for many of its illustrations,

experienced for some years the troubles incident to the wear of their plates in printing, and were compelled to keep a staff of engravers constantly employed in touching up the plates from time to time, as the printing rendered it necessary. The proprietors of this publication arranged with the firm above mentioned for the use of the system of "*acierage* or steel facing," and now only using the original plates for the purpose of electrotyping, retain the originals intact, and save the expense of the repairing engravers, by dispensing with their services. The various Art Unions that require to print large numbers of their plates, now use this process. They are thus enabled to supply all their subscribers with impressions of equal merit, altogether irrespective of the number of copies required. Another advantage, equally important, is, that as electrotypes can readily be duplicated, several presses may be simultaneously employed upon the same plate, to the manifest saving of time in production of large editions.

Hitherto, copper-plate printing has been entirely confined to manual labour, a very tedious and slow process, as may be gathered from the description given above; but, at the exhibition of Printing Appliances held in London in 1880, a copper-plate printing machine was shewn in operation with steam as the motive-power. This seems to answer the purpose intended, so far as ordinary commercial work is concerned, but whether it be competent for fine art work yet remains to be proved. The steam copper-plate machine here alluded to, was exhibited by the same enterprising firm already mentioned—Messrs. Bradbury and Wilkinson.

It will be useful to state that when plates—whether of steel or copper—have been printed, and are to be stored, they should be rubbed over with grease, and packed up in brown paper, as the best means of preserving them from tarnishing,—or what is still more to be dreaded in steel plates, rusting.





CHAPTER II.

Wood Engraving.

BRIEF HISTORICAL SKETCH.

N tracing the rise and progress of the Art of Engraving, the two methods, in *intaglio* and in *relievo*, are found very much to overlap each other in point of date. The earliest form of Wood Engraving is supposed to be that which was found upon stamps made of wood, used by the Egyptians for the purpose of stamping impressions upon bricks or other articles made in clay. The subjects engraved were composed of hieroglyphic characters, and were in *intaglio*, after the manner of plate engraving. Other stamps, which are to be seen in the British Museum and occasionally in private collections, were made in brass and other metals, as well as in wood, and the parts engraved consisted of Roman capitals cut upon the face in *relief*. These are believed to have been employed by the Romans for

marking cloth or paper, and in later times were used by merchants as trade-marks, for the purpose of distinguishing their various wares.

At the outset of his inquiry into the origin of engraving, the student may possibly be shocked to find that one of the early uses—or rather abuses—to which the art was applied was literally to stamp slavery. We are told that the Roman slaves were branded by means of metal stamps, which were engraved with letters.

The following example is taken from Fabretti :—

TENE ME QUIA FYG
ET REBOCA ME VICTORI
AGOLITO A DOMINICU CLEMENTIS.*

Printing has, with some truth but also with a little ostentation, been proclaimed as “the bulwark of freedom ;” engraving, it is clear, could not boast of such distinction in its early use.

About the end of the fourteenth, or beginning of the fifteenth century, the German card-makers, it is believed, adopted the principle of engraving in relief, for the purpose of impressing the outlines of figures upon their cards ; these outlines being afterwards filled in or coloured by means of a stencil. Playing cards, it has been ascertained, were invented in France, but it was in Germany that card-making was first practised as a trade.

In Earl Spencer's library at Althorpe, there is a copy of the celebrated wood-cut of “St. Christopher,” bearing date 1423. This wood-cut has been traced to Augsburg. In the records of that city mention is made as early as 1418 of a *Kartenmacherin*, or card-maker.

* “ Hold me fast, for I am a runaway, and return me to Victor, the Acolyte of the Dominicum of Clement.”—*Dublin Review*, Oct., 1871.

The authenticity of the wood-cut of St. Christopher, and the date of its being engraved, are so well established, that its production may be safely accepted as the historical starting point of this branch of the Art. This block is noticeable as being probably the earliest engraving known, the impression of which was produced by printing and not by burnishing, and undoubtedly the first which bears a date. The copy in the Althorpe library is coloured, presumably by hand, and is pasted inside the front cover of a book, "Laus Virginis," and upon the back cover is pasted an impression of another block, "The Annunciation." These block-prints are drawings with a very brief text,—one or two lines only, which furnished the description of the block; thus the text illustrated the block instead of the contrary plan which now prevails. Most probably the wood upon which these drawings were cut was of pear-tree, apple-tree, or beech, or certainly wood of a softer character than that of box which is now used. A collection of these impressions pasted together in pages, formed a "Block-Book," and in some of these books a connected subject was continued through the series of blocks. For instance, the "*Ars Memorandi*," which is a *memoria technica* for learning the Four Gospels; the "*Biblia Pauperum*,"—or, perhaps, more properly "*Biblia pauperum Predicotorum*," or, "Poor Preacher's Bible," not "Poor Man's Bible," or "Bible of the Poor." Books at that time it can be easily believed were expensive luxuries, quite out of the reach of the poor. At first the impressions were laboriously taken by burnishing, and afterwards, when typography had been invented, by means of the printing press.

The aim of the first printers was to produce copies of books that should as nearly as possible represent the originals that had been executed by the hand of the scribe, and it is reported that some of these early productions of Gutenberg's press were passed off as veritable written copies, and commanded in consequence a proportionately high price. Between the Block-Books previously mentioned and the first Psalter printed at Mentz by Fust and Schoeffer, an immense stride seems to have been made in the wood-engraver's art. The initial letters which ornament this book are marvels of excellence, both as respects engraving and printing; and, although the names of the printers of this wonderful volume,—(for it can scarcely be said to have been yet surpassed,) have been carefully preserved, no record whatever exists as to who was the engraver. The designs, however, are supposed to be due to Schoeffer himself who, like many of the early printers, had previously exercised the profession of a scribe or illuminator. These initial letters were printed in two colours,—red and blue, and are undoubtedly the earliest examples of such printing; previous attempts having been engravings of a mere outline to be subsequently coloured by hand. The relationship, however, between engraver and the newly-created printer was not destined to remain peaceful and uninterrupted. The professional engravers must at this time have been a rather numerous as well as influential body, as they appear to have formed themselves into a Guild or Fellowship. Most probably the engraver himself produced the impressions from his blocks, and so combined the work of printer as well as engraver. The work of the first type-printers,

therefore, seems to have filled the minds of the engravers with alarm and jealousy. Fearing the effect of the new invention upon their interests, they first not only refused to give the printer the benefit of their work for illustrative purposes, but even attempted to "put down" the new art altogether. Shortly after type-printing was introduced into the city, the engravers of Augsburg endeavoured in 1471 to prevent the privileges of a burgess being granted to Gunther Zainer (who was the first printer in Germany who used Roman characters), and also to prohibit the use of wood-engravings in his books. The printer, therefore, thrown upon his own resources, tried his skill as an engraver and made his own wood-cut illustrations as well as he could ; or encouraged some "handy man" already in his employ to do so for him. This will account for the fact that the illustrations first introduced into printed books,—that is, drawings in which figures are employed—are, for the most part, of a very inferior character as compared with the engraved Block-Books which preceded them. This unnatural antagonism between engravers and printers, could not for any length of time hinder the progress of these arts, the interests of which are now seen to be so inseparable. Zainer, in conjunction with John Schussler, a fellow printer who was also suffering from the opposition of the wood-engravers, subsequently obtained, through the intervention of the Abbot of St. Ulric and Afra, an official permission to exercise the art of a printer without molestation ; but they were not at liberty to adorn their books with cuts of initial letters or other illustrations. The guild of wood-engravers, however, afterwards agreed that this

restriction should be waived, so far as Zainer was concerned, on the important stipulation that for all such work the professional engravers should in future be employed.

The credit of the introduction into England of the art of printing, it is well known, should be ascribed to William Caxton, who, in 1477, published "The Dictes and Notable Wise Sayings of the Philosophers." This book, "emprynted by me Wylliam Caxton at Westmestre, 1477," is the first book printed in England, with the date and place of its appearance distinctly stated, and was taken as the foundation of "The Caxton Celebration" held in London in 1877. The previously popular notion that 1474 was the year in which Caxton commenced printing, "in Westminster Abbey," originated in a misunderstanding of the epilogue to the first edition of "The Game and Playe of the Chesse"—where Caxton says, "Fynysshid the last day of Marche, the yer of our Lord God, a thousand four hondred and lxxvij." This date it has been satisfactorily proved gives the time of completing the translation, and has no reference to the period of publication. It has also been proved that this first edition was printed at Bruges and not in England: the second edition of this book, printed in 1482, was the first edition printed in England.

William Caxton, besides being acknowledged the first printer of England, is also entitled to the distinction of similarly introducing wood engraving into this country. The first book printed in England which contains wood-cut illustrations is the second edition of Burgh's *Parvus et Magnus Catho*, which appeared about the year 1481. In the early books

printed by Caxton, a blank space was left for the initial letters; and the initial that was required was indicated by a small letter placed in the vacant space. The intention was that the initial letter should be supplied by the illuminator; and as reading was in those days an accomplishment, and not as now almost a birth-right, the illuminator was not always to be trusted to put in the proper letter without some distinct instruction.

Caxton's "Game and Playe of the Chesse" contains sixteen separate wood-cut illustrations, several of which are more than once reproduced in the work; and others of Caxton's books are similarly illustrated. In all these illustrations the only attempt at shading is by a series of parallel lines; occasional heavy solid pieces being left, without much regard to artistic propriety, but apparently only to relieve the otherwise dull uniformity of colour.

The next development of the art was the introduction of what is technically called "cross-hatching," and consists of lines crossing each other at different angles. As these lines are more or less thick or close together, so is the shading thus produced darker or lighter. The much talked of, and, as a work of art, greatly overestimated *Nürenberg Chronicle* contains some instances of cross-hatching, but perhaps the earliest example is that in the frontispiece to the Latin edition of *Breydenbach's Travels*, printed at Mentz, by Erard Reüwich, in 1486. This is a far better specimen of engraving than anything to be found in the *Nürenberg Chronicle*, which was not printed until seven years later; being both in design and execution better than anything that had preceded it. The artist and the engraver of

this cut are alike unknown, although the work has been by some attributed to Wohlgemuth. Michael Wohlgemuth having been known to have imparted instruction to Albrecht Dürer, it has come to be supposed that both were engravers upon wood. This is at least questionable, although the only evidence to be adduced may be considered of a somewhat negative character. The illustrations in the *Nürnberg Chronicle* were executed under the superintendence of Michael Wohlgemuth and Wilhelm Pleydenwurff, who are described in the *Colophon* as "mathematical men," and skilled in the art of painting. It may be noticed, before dismissing the *Nürnberg Chronicle* from consideration, that the cuts therein are for the most part very indifferently done, even for the time, and that the so-called portraits are made to do duty over and over again for various persons of distinction.

This period in the history of wood engraving is rendered conspicuous by the name of Albrecht Dürer already alluded to, and he has generally been supposed to have been celebrated as a wood engraver, from the fact of so many wood engravings bearing his monogram. The son of a native of Cola, in Hungary, Albrecht Dürer, was born in Nürnberg on the 20th May, 1471. His family connections appear to have been goldsmiths, his father and his maternal grandfather both following that occupation; and Albrecht was educated in the same art. He continued with his father until his sixteenth year, by which time he had acquired the ability to execute superior works as a goldsmith. At this part of his career, to his father's great displeasure, the young Dürer sought to become a painter, and having obtained a reluctant consent to his importunities, he became in

1486 a pupil of Michael Wohlgemuth, for the purpose of learning painting. The art of copper-plate engraving was, in those days, closely allied to that of the goldsmith, and the two occupations were often practised by the same person, and it is highly probable that while learning to become a goldsmith with his father he acquired some knowledge also of copper-plate engraving. To this knowledge he was now to add the practice of a painter, and there is no reason to doubt that the copper-plate engravings which bear his mark, were not only designed, but engraved by him. The work of engraving on wood was, as has been shown, work of altogether a different character and aim, and there is no evidence of his exercising his talent in this direction, and the inference is that, in these wood-cuts which bear his mark, his skill was simply directed to making the drawing upon the wood, ready for the engraver. Mr. John Jackson, in his treatise upon wood engraving, gives some observations calculated, from an artistic examination of the engravings themselves, to substantiate this view of the matter.

"Looking at the state of wood engraving at the period, I cannot think that the artist would experience any difficulty in finding persons capable of engraving them. In most of the wood-cuts supposed to have been engraved by Albert Dürer we find cross-hatching freely introduced—the readiest mode of producing effect to an artist drawing on wood with a pen or a pencil, but which to the wood engraver is attended with considerable labour. Had Albert Dürer engraved his own designs, I am inclined to think that he would not have introduced cross-hatching so frequently, but would have endeavoured to attain his object by means which were easier of execution At the time when Dürer published his illustrations of the Apocalypse, few wood-cuts of much merit either in design or execution had appeared in printed books; and the wood-engravers of that age seem generally to have been mere workmen, who only understood the mechanical branch of their art, but who

were utterly devoid of all knowledge of composition or correct drawing ; and there is also reason to believe that wood-cuts at that period and for some time after, were engraved by women. As the names of those persons were probably not known beyond the town in which they resided, it cannot be matter of surprise that neither their marks nor initials should be found on the cuts they engraved from drawings of such artists as Albert Dürer."

It may, however, be urged that if it be admitted that the copper-plate engravings which bear Dürer's mark were engraved by him, it should equally be admitted that the wood-cuts similarly marked were also his engraving. Mr. Jackson meets this objection as follows :—

" In the age of Albert Dürer most of the artists who engraved on copper were also painters ; and most of the copper-plate engravings which bear his mark are such as none but an artist of great talent could execute. It would require the abilities of a first-rate copper-plate engraver of the present day to produce a *fac simile* of his best copper-plates ; while a wood-engraver of but moderate skill would be able to cut a *fac simile* of one of his best wood engravings after the subject was drawn for him on the block The copper-plates could only have been engraved by a master, while his wood-cuts might be engraved by a working *formschneider* who had acquired a practical knowledge of his art by engraving the wood-cuts of the *Nürnberg Chronicle*." [p. 285.]

Dürer also frequently described himself as "painter," but never as engraver. See the first edition of the Apocalypse, 1498, "printed by Albert Dürer, painter ;" also on the cuts of "The Passion of the Cross," it is stated "drawn and pictorially represented" by Albert Dürer.

The settlement of this question does not rest, however, upon merely theoretical testimony, for the late Mr. Thompson had an opportunity of bringing his great technical experience to bear practically upon the subject by a careful examination of some of these

blocks. Mr., afterwards Sir Henry Cole, while adopting the *nom de plume* of Felix Summerly, engaged Mr. Thompson to repair the casts taken from Dürer's "Little Passion," which are deposited in the Print Room of the British Museum. From the critical observation of this celebrated engraver he arrived at the conclusion that the blocks had been engraved by various hands, which was sufficiently proved by the manner of working indicating corresponding differences in the method of handling the tools.

Dr. Moriz Thausing, by virtue of his elaborate treatise in German on the Life and Works of Albrecht Dürer, is entitled to be considered as the most reliable authority on the subject; and he very emphatically endorses the opinion that this artist was not the engraver of all the wood cuts which bear his monogram. In the English edition of Thausing's work, translated by Mr. Frederick E. Eaton, Secretary of the Royal Academy, it is indeed stated that "no trustworthy evidence exists of Dürer having himself worked at wood-engraving." [p. 261, vol 2.]

The belief in Dürer's skill as an engraver upon wood is not absolutely necessary to a correct appreciation of the marked improvement in wood-engraving, which may fairly be said to be traced to the influence of his genius. That the artist made the drawings upon the wood no one has ever questioned, and herein it may be said lies the secret of the advance in this form of art noticeable at the period of Dürer's activity. Dr. Thausing, who, as keeper of the Albertina collections at Vienna, had singular facilities for forming a correct judgment, gives the opinion that "it is as a painter and draughtsman, and not as himself an engraver, that

Dürer must be considered the reformer of the old style of wood-engraving." It is certain that this artist thoroughly understood the capabilities of wood-engraving, and he showed by his drawings upon the blocks that he expected better effects from the skill of the wood-engraver than had previously been obtained. When engaged in the work of sketching upon the wood in "pen and wash," it can easily be understood that, being untrammelled by the mechanical difficulties of the engraver's art, his genius had full scope ; and for this reason the assertion may be justified that "the inexhaustible wealth of Dürer's imagination was even more strikingly shown in his wood cuts than in his engravings upon copper." [p. 72, vol. 2]. "Never has such precise drawing been combined in the same plate with such delicate execution, admirable as the work produced since Dürer's time has been in both respects." [p. 202].

Possibly the most important consideration in thus disallowing the claims which have been put forward of Dürer's skill as an engraver upon wood, is the fact of the great difference which is to be found in the character of the cuts attributed to this artist, and unquestionably produced at the same date. Had these cuts been all engraved by the draughtsman himself, no very glaring difference would, in all probability, be perceptible. Directly, however, it comes to be admitted that the actual engraving was the work of other and various hands, the great dissimilarity in style and skill is at once accounted for. It is known, for instance, that the wood-engraver HIERONYMUS ANDRÆ was employed upon engraving the cuts for Dürer's plates of the Triumphal Procession of the Emperor Maximilian.

The story is also related of the difficulty experienced in procuring the blocks from the engraver after completion, as he purposely withheld them until the payment for his work had been made. Legal proceedings were instituted, in the course of which the Council of Nürenberg declared that "Hieronymus is a particularly clever artist, and the most celebrated in the empire at the kind of work upon which he has been employed by the Emperor and his representatives."

Besides the doubt which is thus seen to hang over the authenticity of the wood-cuts of Dürer as the actual work of his graver, a similar uncertainty must rest even upon some of his drawings; for the writer of the private journal says "this has been a much better bargain for us than we ever could have dared to imagine possible: *they were chiefly small water-colour drawings, many of which it is very doubtful if Dürer ever touched.*"

Among the most celebrated of his works are the Apocalypse, printed at Nürenberg. This was one of his earlier works, and was so much admired that the cuts were pirated at Strasbourg, a proceeding which called for a "caution" from Dürer, pointing out the pains and penalties which would be incurred by selling in Germany spurious and unauthorized copies.

The "Life of the Virgin," consisting of nineteen large cuts (size $11\frac{3}{4}$ inches by $8\frac{1}{4}$), and a title-page, appeared in 1511, and this was soon followed by a series of eleven designs known as the "Large Passion."

The peculiarities of Dürer's pictures are the great improvement which they exhibit in the knowledge of perspective, the skilful grouping of the figures, and the artistic manner in which the subject of the picture is

made to stand out from its background, as well as the more elaborate and appropriate character of the background itself.

Besides the great number of paintings, engravings on copper, and drawings upon wood which he completed, he was the author of three works, all of which were illustrated, the last relating to his art, and entitled "The Proportions of the Human Form." He died at the age of fifty-seven, on the 6th April, 1528.

Other names celebrated for having made designs upon wood for engraving might here be introduced, with some account of their work ; but as they are not associated, like Dürer, with any marked advance in the art of wood engraving, it will be quite sufficient merely to mention the names of some. Such are Lucas Cranach, Hans Burgkmair, Hans Schäufelein, Hans Spriginklee, and Hans Holbein. The last-mentioned is celebrated for the production of "The Dance of Death," published in Lyons in 1538, and "The Bible Cuts," which appeared at about the same date. Holbein's name is familiar to all as a painter, who was, upon his first visit to England in 1528, taken into the service of the King, Henry VIII, from whom he received an income of £30 per year ! Some of his paintings are preserved at Hampton Court Palace and other well-known places ; but it is in connection with wood engraving that his name should here be mentioned. The popular belief is that Holbein designed the series of drawings known as "The Dance of Death," and also engraved them on wood ; but although the drawing or designing is unquestionably due to Holbein, the engraving of this series, it is known, was by Hans Lutzelburger.

From the middle of the 16th to the end of the 17th century the race of artists who in Germany had occupied themselves in making designs for wood engraving, seems gradually to have been threatened with extinction, and wood engraving experienced neglect and decline. A similar decline also fell upon the art in France and Italy, and copper-plate engraving became again the medium for illustrating the better class of works. In England, on the contrary, the wood-cuts of this period shew considerable improvement, and became frequently used for illustrated titles; and, although a similar decline in the art was here also experienced, it did not present itself until a much later date. After a considerable period of decay, the art again revived, and the first English name of importance met with is that of Bewick.

THOMAS BEWICK was born at Cherry-burn in the county of Northumberland, in August, 1753. At the age of fourteen he was apprenticed to Mr. Ralph Beilby, of Newcastle, an engraver of copper-plates and of brass door-plates, but who had some knowledge of, or at least, on occasions he undertook, engraving on wood. On one such occasion a wood engraving was entrusted to Bewick while yet an apprentice. This opportunity seems to have given rise to the desire to pursue this branch of engraving exclusively, and with such success did he apply himself that he met with the reward of a premium from the Society for the Encouragement of Arts and Manufactures, in 1775. He visited London in 1776, but the following year found him again in Newcastle, when he entered into partnership with his late master Mr. Beilby. It was during this connection that Bewick projected

and accomplished those works which have handed his name down to posterity, and will keep his memory green, not only as the most successful and talented engraver of his day, but as one whose work has, in many respects, not been excelled. "The History of Quadrupeds," and "The History of British Birds," the first volume of which was published in 1797, were his most important works. Thomas Bewick died in 1828.

Bewick's successors in the art include his brother John, Charlton Nesbit, Luke Clennell, and William Harvey, all having been pupils of Bewick. A sad history pertains to Luke Clennell. After making a reputation as a wood engraver of great ability, he devoted himself with marked success to painting. In 1814 he was commissioned to paint a large picture for the Earl of Bridgewater, and before completing it he lost his reason; shortly afterwards his wife also became insane and died. The unfinished painting was subsequently completed by E. Bird, R.A., who also became a prey to the same malady.

WILLIAM HARVEY, a favourite pupil of Bewick, began his career as a wood engraver, and ultimately distinguished himself by his drawings upon wood, to which occupation he afterwards wholly devoted himself. Among the most important of his works may be mentioned the illustrations to Charles Knight's edition of Shakespeare, and to Lane's "Arabian Nights' Entertainments." Although exception may be taken to many of Harvey's designs as being incorrect, or, to use a technicality, "out of drawing," they were always effective, and displayed a thorough knowledge of the peculiar capabilities of wood engraving. Harvey's wood-cut from Hayden's large picture of "The Death

of *Dentatus*" is a most favourable specimen of his skill, both as draughtsman and engraver. He also exercised his pencil upon illustrations to Bunyan's "Pilgrim's Progress."

ROBERT BRANSTON, who lived 1778 to 1827, was, like Bewick, almost a self-taught man, and, like him, of great ability. He excelled principally in "figure subjects," and, besides achieving a distinguished name as an engraver, exercised considerable influence upon the destinies and progress of the art in London. Branston is, however, to be especially noted from the fact of one of his pupils, John Thompson, becoming the most talented wood engraver of his time, and one that has not yet, in certain subjects, been surpassed.

The name of SAMUEL WILLIAMS, who died in 1853, deserves mention in this place, as one of the best wood engravers and designers upon wood of his time. The Print Room of the British Museum is particularly rich in specimens of this engraver's work, which were presented to the nation by his sons. Other good names belonging to the modern English school of wood engravers are: Ebenezer Landells, W. J. Linton, Henry Linton, W. T. Green, John Jackson (author, in conjunction with Chatto, of the celebrated "History of Wood Engraving"), J. W. Whymper, William Henry Powis, Joseph Swain (engraver of *Punch's* cartoons), W. L. Thomas, George and Edward Dalziel, Mason Jackson, W. J. Palmer, &c.

Of quite recent date, perhaps no one has contributed more to the advancement of book illustration by wood engravings than Mr., now Sir John Gilbert, R.A. For many years his were the most frequent as well as the most effective drawings upon wood that were

given in the illustrated periodicals ; and the success of more than one such publication was in great measure due to the labour of his hand. Sir John Gilbert has always been a most industrious artist, and as a draughtsman upon wood his name will long be remembered. His illustrations to "The Salamandrine" of Charles Mackay, to Longfellow's Poems, and to Staunton's edition of Shakespeare, are well known. These designs were all most successfully engraved by the Brothers Dalziel.

Consequent upon the recent and marvellous extension of illustrated periodical literature, the plan has necessarily been adopted of very much dividing the work of engraving, in order to arrive at greater expedition in the production of blocks, so as to meet the exigencies of a fast-recurring day of publication. By this means the responsibility of the individual for the excellence of an engraving is completely lost; and although the vast addition to the amount of work required has considerably increased the ranks of engravers, it may be questioned whether this wholesale production has not tended in a great measure to deterioration in quality. A page-block—that is a block occupying a full page—of such publications as *The Illustrated London News*, *The Graphic*, or *The Pictorial World*, is capable of being sub-divided so that twelve engravers may be simultaneously engaged upon it. It is but fair, however, to make exception in favour of some of the large portraits that occasionally appear in these and similar publications, as being not only faithful as portraits, but particularly good as specimens of engraving; but these instances only prove the justice of the above observations, for such portraits are almost always engraved entirely by one engraver.

The exhibition in connection with the Caxton Celebration of 1877, held at the South Kensington Museum, was particularly rich in specimens of early wood engravings, which were contributed by the late Michael Caspari. The following list, compiled by the collector, will be interesting to the reader, particularly as this rare collection has since been dispersed.

GERMAN SCHOOL.

- Various Block Prints ; the incipiency of the Art.
- Title and principal Cuts from the *Nürnberg Chronicle* of 1493, probably by Wohlgemuth, the master of Albrecht Dürer.
- Albrecht Dürer. The Great Passion. Suite of 12.
- Do. The Little Passion. Suite of 37, including the rare original Title.
- Do. The Apocalypse. Suite of 16.
- Do. From the Apocalypse, B. 74, in proof state, with German Text of 1498 and Latin Text of 1511.
- Do. The Life of the Virgin. Suite of 20.
- Do. The Trinity.
- Lucas Cranach. The Great Stag Hunt.
- Do. The Four Tournaments.
- Hans Baldung Grün. The Stag Hunt in Löserwald.
- Hans Holbein. Subjects from the Dance of Death, appearing *only* in part of the edition of 1562.
- Do. Dagger Sheath, with figure of "Fortuna."
- Do. Erasmus with the Terminus, in three different states.
- Do. Landscape, &c. Curious piece, undescribed.
- Do. Two Titles to Galenus, printed at Basle, 1562, and Venice, 1565 ; evidently after the same design, but cut by different hands.
- Jost de Neckar (one of the most renowned wood engravers of the period). The Peasant and the Judge. After Holbein's Dance of Death.
- George Scharffenbergk. A View of the City of Görlitz in 1566.
- J. G. Flegel. The Witches in Macbeth. Designed by Kaulbach, and drawn on the block by Professor Eichens.
- A. Levy. A most curious piece of wood engraving, in the style of Francisco Goya.

DUTCH SCHOOL.

- Lucas van Leyden. The Three Heroes of Israel.
 Do. Virgil suspended in a Basket.
 Hieronymus Bosch. The Temptation of St. Anthony.
 Christoffel Jegher. After Rubens. Christ and St. John with the Lamb.
 Do. Hercules killing Cacus.
 Do. Repose in Egypt.
 Do. Le Jardin d'Amour.

ITALIAN WOODCUTS.

- Five illustrations from Poliphili Hypnerotomachia, printed by Aldus, 1499. Art critics do not agree as to the artist of these exquisitely beautiful designs.
 Nicolò Boldrini. After Titian. Landscape, with a Woman milking a Cow.
 Cambiasi. Triumph of Galathea.
 Giuseppe Scolari. A bold design of St. Jerome in the Desert.

FRENCH WOODCUTS.

- Three Sheets, with the complete set of the Dance of Death, from a Livre d'Heures printed by Simon Vostre in Paris, 1498-1500, on vellum. Manière criblee.
 Geofroy Tory. Title to Bible, with printer's device of Robert Stephani, 1546, with an exquisite vignette on top.
 Eduard Ecmann. After J. Callot. Battle of King Tessi.

ENGLISH WOODCUTS.

- Luke Clennell. A Ship at Sea. N.B.—“The best illustration of a Ship in a Storm ever executed, either on wood or copper.”—*Jackson and Chatto*.
 Henry Dudley. An Old Seal. Said to be one of the finest specimens of wood engraving ever done.
 Charlton Nesbit. St. Nicholas' Church at Newcastle. For this cut he received a medal from the Society for the Encouragement of Arts and Manufactures.
 John Thompson (the prince of wood engravers). Thirty-two Illustrations to the Vicar of Wakefield, after the designs of Mulready.
 Do. Thirty-two Illustrations to Shakespeare.

AMERICAN WOODCUTS.

- Anderson (the American Bewick). Three specimens of his style.



WOOD ENGRAVING (FAC-SIMILE) by DALZIEL BROTHERS, after BIRKET FOSTER.

and the joins with the
springs of bone.

... painted by
the artist of
Wanna

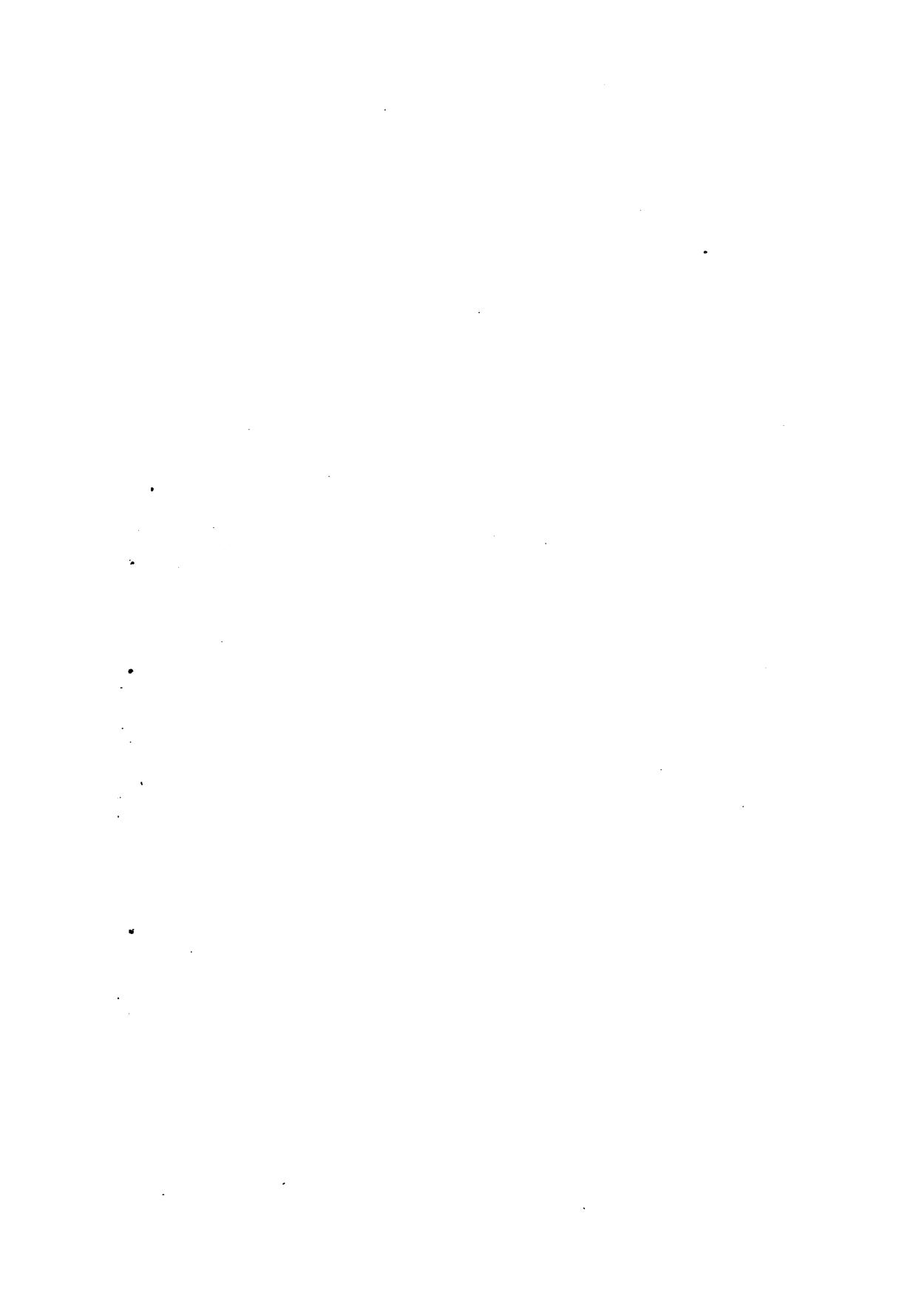
... in the Desert.

... of Death,
... in Paris.
... Robert
... Paul.

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... Thirty-five
... after the
... of the author,
... his style.



WOOD ENGRAVING (FAC-SIMILE) by DALZIEL BROTHERS, *after* BIRKET FOSTER.





WOOD ENGRAVING by DALZIEL BROTHERS, from *Wash Drawing*,—J. T. REID.

PRACTICAL DIRECTIONS FOR
WOOD ENGRAVING.

THE only description of wood now used for engraving is that of the box tree cut horizontally or in section. In the early days of engraving the wood of the apple, pear, and beech tree were used, and the wood was cut in the direction of the grain instead of across it. The largest boxwood,—that is about 4 or 5 inches in circumference,—is obtained from America or Turkey, but the smaller English wood is considered the best, being closer in texture and shorter in grain. That which is of an uniform yellow colour is to be preferred for the best class of work ; wood that is uneven in colour, or is red or white, is to be avoided. The successive stages of growth in the wood is shown by a series of rings, and if the growth has been regular there will not be much difference in colour in these different rings, and consequently the texture of the wood will be tolerably uniform. The box tree never grows to any great size, and therefore when a wood-cut above four inches square is required, several pieces have to be joined together to produce the required block. There are two methods of securing these several pieces together ; one called "amalgamated" is by gluing the pieces together, with a tongue of some other wood let into the adjoining pieces. The other method is called "bolted," and the several pieces are secured by screws and bolts let into the substance of the wood. This latter method was first adopted by Mr. Wells. Blocks of any dimensions can be procured thus prepared, as also keys for screwing or unscrewing the separate pieces.

The block having been procured it will be noticed that it presents a highly polished surface, and in this condition is not suitable for drawing upon. The first care, therefore, is to give the block a coating upon its face that shall answer the double purpose of neutralizing the glare of the polished surface and also providing a sufficient resistance to the artist's pencil in drawing. For this purpose apply some finely powdered brick dust; then mix flake or Chinese white with a little water and spread it over the surface of the block, rubbing it with the palm of the hand till it is nearly dry. The hand will readily detect any lumps or grit that may have previously escaped notice, and these must be immediately removed.

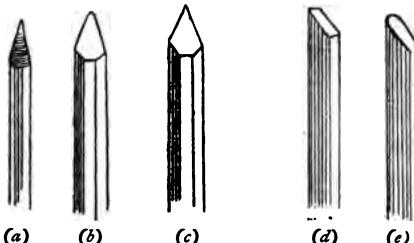
The artist now proceeds to make the drawing upon the block, which he does either wholly in pencil, or partly in pencil and partly in "wash" or Indian ink. Whichever plan be adopted a sketch is first made upon any ordinary paper,—which may be made use of as a tracing. Some red chalk is now scraped on to the back of the sketch, and rubbed on the paper with the palm of the hand or a piece of flannel. The paper is then laid on the block with the red side downwards and secured by gum or wax to the sides of the block to prevent shifting. With a hard pencil the artist goes over the lines of the sketch, and upon removing the paper it will be found that wherever the pencil has traversed the paper a distinct red line has been left on the face of the block. The outline of the subject being thus defined the drawing is now made, if with pencil, by using an $H\bar{H}H$ pencil, and drawing every line that the artist wishes should appear in the finished engraving. If the drawing is to be

made partly in wash, having traced the outline in pencil, the shadows are washed into the picture, and what may be called the "marks of expression" are carefully pencilled; strong lights in such drawings are indicated in body colour, using flake or Chinese white for the purpose. Of course it must be remembered that, in printing, the subject will appear reversed,—that is to say the figures which in the original drawing may occupy the right of the picture, in printing will appear on the left. Should it be necessary for the subject to appear in print precisely as it does in the original drawing, it must be reversed in drawing on the wood. Where the block is an original drawing this may be done by applying the red chalk on the pencilled side of the sketch and then trust to the principal lines being sufficiently indicated on the back of the paper by the marks of the pencil. If the paper used be very thin and transparent, like tracing paper, there will not be any difficulty in getting this outline on the block. To put in the details of the picture correctly, the original drawing is to be placed in front of a mirror and the artist will thus work from the image reflected in the glass.

Where the drawing is made wholly in pencil, the work of the engraver is called "fac-simile," because every line and mark of the pencil drawing has to be carefully preserved. When "wash" is used to show the tone and shadows, the engraver has to make use of such lines and tinting as will produce upon the engraved block the proportion of colour or tone indicated by the wash. Of late years photography has been very extensively employed to give copies of drawings upon wood for the purposes of engraving.

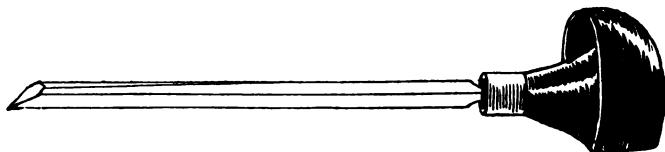
The special advantage of this application is that an exact copy of any drawing or engraving may be permanently depicted upon wood, reduced or enlarged to any required scale. It may be mentioned that many of the designs which adorn the pages of *Punch* are drawn in ink on a large scale and afterwards transferred to wood by photography. After the photographic image has been secured upon the wood, the artist frequently goes over the picture to repair or emphasize any portions with his pencil. In the case of a block which is composed of several pieces bolted together, and which is to be given to various hands to engrave, the block is not unscrewed immediately the drawing is completed; but the engraver to whom the completed drawing is entrusted, first goes over the block and with his graver cuts all the lines that cross the various joins of the separate pieces, in order to obtain uniformity. The block is then unbolted and the separate pieces apportioned to the different engravers who are to be employed upon it. Each engraver upon receiving his "piece" covers the face with paper, fastening the paper to the sides of the block with wax, and as the work progresses he tears off or removes the paper. This is done to prevent the lines of the drawing being lost, by rubbing, or by the moisture from the hand or breath, while being engraved.

The engraver should be provided with a series of tools, varying in size and fineness. Generally he will require about eight each of gravers, graver-tints, and tint-tools, while two gouges and one flat tool or chisel will suffice. Graver-tint tools are necessary in engraving drapery or any description of work that requires a flowing line.



(a) Graver. (b) Graver-tint. (c) Tint-tool. (d) Flat tool or chisel.
(e) Gouge or scorpier.

These tools are all made with handles completely spherical at the butt end, but before using it will be necessary to cut off one half of this handle. The tool will then present this appearance,—



The object is to ensure greater comfort in handling, as well as to prevent loss of time by the tools rolling about on the table or bench when out of use. Before commencing to engrave, the block is placed before the operator upon a round leather pad, which prevents the block slipping while being cut, and thus offers a sufficient resistance to the pressure of the hand. This also enables the engraver to turn his block round, which he does frequently, so as to make all his incisions upon its surface with a forward or pushing motion. When pursuing his occupation by lamplight (a proceeding which the modern system of "rushing out" blocks in a short space of time necessitates) a

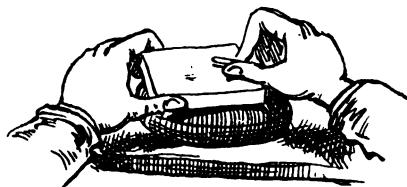
globe filled with water slightly tinted with green should be used, through which the rays of light from the lamp must be directed so as to fall conveniently upon the block. This pale green tint may be given to the water by adding small quantities of copper filings and dilute nitric acid, regulating the quantities so as to produce the tint desired. Whether working by the light of day or by artificial light, the operator is recommended to wear a shade, as well to protect the eyes by taking off the surrounding glare of light, as to concentrate the vision upon the portion of work in hand.

In a "Description of Trades" by Hans Sach, published in 1564, there is an illustration depicting an engraver at his occupation, and from this it is gathered that the early engravers used a tool closely resembling a long-bladed desk penknife; it is also seen that in using this tool the operator produced his incisions by drawing the blade towards him. It will be noticed that as the wood was used upon the plane surface and not in segment, the present method of using the graver could not then have been employed.

In a newly purchased tool it will be observed that upon its sides there are lines left in the steel; now as the face of a tool depends upon its sides as well as upon its point, it will be obvious that these irregularities, slight though they may be, must be removed. This is usually done by applying on a slab of box-wood, a paste made by mixing emery powder with sweet oil; the sides of the tool are then rubbed upon this slab, taking care to hold the tool perfectly flat, otherwise a convex surface will be produced. The point of the tool will also require some regulation. If the angle

formed by the lines of the face and the belly of the tool be too obtuse the block will require to be held much to the right hand of the engraver, or he will not see the work the graver is doing. If on the other hand this angle be too acute, the point is liable to break, and also to enter the wood too deeply, thus becoming liable to undercut the lines occasionally. Another important matter is the temper of the steel. If it be necessary to correct any deficiency in this respect, a good indication of the proper degree to which the metal should be heated is shewn by the tool becoming of a straw colour; then dip it in sweet oil, or allow it to cool gradually. A purple tinge, on the contrary, will produce too soft a condition in the metal. For sharpening tools a Turkey stone should be used. A graver with a slightly curved belly will be found useful in engraving those parts of blocks that have been lowered.

In commencing the practice of wood-engraving the proper position of the hand is a matter requiring attention.



The above illustration will at once guide the pupil to a correct position, to which must be added some hints as to the best method of procedure. The first work attempted should be the cutting of straight lines, first "outlining" them correctly with a fine graver, then, with a larger graver, going over the lines a second

time, removing a little more of the wood from the line, and lastly, clearing out with a scorper the wood left between the lines. Three tools will thus be brought into requisition, and when the learner has acquired some facility in this work, he may apply himself to "cross hatching." The thickest lines are first to be finely outlined, then outline the thinner lines up to the lines already done. The lines being thus all outlined, take a square or lozenge-shaped graver, and inserting the point of the tool into the corner of one of the squares, push it in firmly up to the middle of the square. The block should afterwards be turned round, and with a similar action the other half of each square is to be removed. This "cross hatching," as has been previously stated, is not difficult, and indeed, only requires patient perseverance to accomplish it well.

The next description of work to be essayed is the engraving tint lines, and this should be begun upon a small block, carrying the lines the entire width of the block, gradually increasing both the size of the block and the length of the line. This should be followed by a trial of wave-tints, or tints produced by parallel wave lines in place of straight ones. Some little practice at this work will give steadiness to the hand, and prepare the pupil for engraving drawings of simple subjects. There are two descriptions of drawing that will here present themselves; one where the subject is a simple outline produced by lines of an uniform thickness throughout,—very useful in architectural drawings, or delineations of statuary; and the other, where the subject of the drawing has substance and relief given to it by lines varying in thickness in different parts. Whichever style be first adopted, at this stage of the

learner's progress the drawing upon which he is to be employed should not be complicated by the introduction of any lines of shading.

Here it may be well to mention that in cutting the block, the belly of the graver rests upon the block, and the unengraved parts of the block act as a fulcrum in taking out the "whites" of other parts. The most suitable parts of the block upon which to rest the graver, are parts that are afterwards to be cut away, but where no such parts conveniently present themselves, the pupil will use a piece of card under the tool to prevent the work being rubbed or otherwise injured. Especial care should be used to prevent undercutting any lines left in the engraving, as the inevitable result will be that, directly pressure be brought to bear upon such lines, they will break away. The furrow left by the graver should present an acute angle, and not be rectangular.

The pupil is recommended, before proceeding to attempt subjects in which shading by lines is introduced, to aim at producing all the effect possible out of simple outlines, varying the substance of these lines in different parts of the work.

In drawing upon wood for the engraver, firmness of line and correctness of drawing will be requisite. As the business of the engraver is only to cut the lines as they are drawn, any defects in the drawing will necessarily be observable when the block is finished. The shading or tone of the picture, as previously mentioned, may be drawn in detail upon the block for fac-simile engraving, or the artist may employ Indian ink or "wash" for the purpose. In this latter case the engraver will be thrown upon his own resources to

preserve the indicated tint by such lines, and cut in such directions, as will occur to him as most suitable for the particular purpose. In the execution of such work the employment of the engraver ceases to be mechanical and becomes artistic. Where the subject of a drawing is to be surrounded by tint, the engraver should cut the tint before completing the principal figure; he will thus avoid the danger of cutting into the subject should the tool slip while cutting the tint.

It will be better that he should leave his lines too thick rather than too thin, if he entertain any doubt as to the effect of his work; as in the one case he can easily remedy the defect, but in the other, success is so precarious as to be almost impracticable. To lighten lines that are too heavy, it is obviously only necessary to pass the graver along them again, reducing their substance; and reducing the colour of a tint may be effected by cutting lines across the tint. Light or faint lines can only be strengthened by rubbing them down slightly with a burnisher, but this is a very dangerous and uncertain expedient, and had better be avoided if possible. Any error or mishap, however, if it be considered important, can be remedied by inserting a plug, which will be more conveniently accomplished by the person who prepares the wood and from whom the block is purchased. The plug having been inserted is cut down to the level of the face of the block, and can then be re-engraved.

As impressions of wood-cuts are taken by the ordinary means of letter-press printing, which is by pressure of a flat surface upon the face of the block, it will be seen that there will be some difficulty in printing, with the requisite delicacy, lines that are

unprotected or stand alone. This is particularly obvious if the wood-cut be a vignette, and where the lines of the engraving require to be graduated in colour towards the outside, so that the edges of the block almost imperceptibly fade away into the white margin. Although it be quite possible so to print a vignette as to meet this requirement, yet it is acknowledged to be attended with difficulty, and, in order to facilitate the printing, it is customary for the outer edges of the vignettes, and also for certain light parts in the body of a drawing, to be "lowered," which is effected by paring off a portion of the surface of the block where the printing is required to be faint. In "lowering," when applied to light clouds in the sky of a landscape, first cut outside the cloud with a scorper, but preserving the shape of the cloud, then with a flat tool cut or pare the surface of the wood gradually. Bewick practised this "lowering" very frequently, as may be seen in many of his blocks; and it has been more or less adopted by every engraver of note since. In the large quantity of rapidly produced blocks which are now necessitated by the periodical illustrated literature of the day, this lowering is less frequently resorted to, and indeed, as printing of wood-blocks has greatly improved, it is not now an essential requisite for obtaining good impressions.

The following hints may be useful both to artists and engravers.

Never let a block, whether plain, drawn upon, or engraved, rest on its flat surface, but let it always stand upon its edge when not in use. The face or the back of a block is more liable to absorb the

moisture of the air, or to become dry, when laid flat than when on its edge, and warping is the inevitable consequence. When blocks are being seasoned, before being polished and prepared for the artist, they are invariably placed upright in racks.

To transfer an old impression from a block or engraving to wood, for the purpose of copying or re-engraving, first moisten the back of the paper upon which the engraving is printed, with a mixture of concentrated potash and essence of lavender, in equal quantities; this causes the ink readily to separate from the paper. When the paper is nearly dry, the engraving is placed face downwards upon the prepared block and moderate pressure employed, when it will be found that the ink has been transferred to the wood.

The block having been engraved so far as the subject is concerned, the engraver may desire to see an impression of his work, that he may notice how far he has been successful in delineating the intentions of the artist. This is usually done by the engraver himself, even before he has removed the large pieces, to be afterwards cut away with the gouge or scorper. Indeed, the large pieces need not be cut away at all, unless the original block is to be printed, as the electrotyper, when making his wax mould, will remove them in his mould. Particularly is this plan advantageous in the case of vignettes, as the outer ring of wood, if left, will serve to protect the edges of the engraved part from too heavy an impression. The block is first coated with printers' ink, which is applied in very small quantity with a ball, dabber, or roller, taking care that the parts which are intended to appear black are sufficiently inked, while the lighter parts

have but little ink applied. A shield or guard is now cut out of paper the exact size of the pieces that have been left, so as to leave exposed only those parts of the block of which an impression is required ; then the paper (usually India paper) is laid upon the surface, and with a burnisher the engraver gently rubs the back of the India paper, giving more pressure and longer rubbing to the parts that are most solid in the engraving. Should the engraving be of a delicate character, it is well to apply a piece of card under the burnisher. Having taken his proof, the engraver is now enabled to see if any "touching" is required, as not unfrequently minute pieces have been left to print that had been inadvertently missed while cutting out the "whites." The block is then fit for the printer, or for the electrotyper, as may be required. When large numbers of impressions are to be printed, an electrotype should be taken from the block for printing from, as in case any accident should happen during the printing, the electrotype can be replaced, while, if the block itself be injured, there would be no escape from going again through the whole process of drawing and engraving.



PRINTING WOOD-CUTS BY HAND-PRESS OR AT MACHINE.

PREVIOUS to the year 1832, printing by hand-press was the only method ; and although steam-printing, or more correctly, printing by steam power was introduced

as early as 1814, yet printing wood-cuts by machinery was until about the first mentioned date considered entirely out of the question. In 1832, however, the printing of wood-cuts by machine was successfully accomplished by Messrs. Clowes & Sons, and their maiden effort was a work upon "Cattle," undertaken for the Society for the Diffusion of Knowledge. This year was also rendered memorable in the annals of printing by bringing forth a number of periodical publications illustrated and otherwise, among which may be mentioned "Chambers' Edinburgh Journal,"—a work which, after a lapse of half a century, is as popular as ever; "The Penny Magazine,"—the earliest periodical continuously illustrated with wood-cuts, and "The Saturday Magazine," also illustrated. All these publications were printed upon machines.

Printing by hand-press is now almost superseded, and is only admissible where but a limited number of impressions may be required. If, on the other hand, a large circulation is to be provided for, the adoption of the printing machine for the purpose is imperative.

At press, the first care is to ascertain if the block be perfectly level, and if not so, to remedy the defect by applying "underlays," or pieces of paper placed under the lower or depressed parts of the block. When made level and fixed upon the bed of the press in an iron frame or "chase," the pressman proceeds to pull an impression, taking care not to exert undue pressure, for fear of injuring the more delicate parts of the engraving. Carefully selected parchments should be used for the tympans of the press, and in place of a blanket, sheets of fine paper should be inserted between the two

tympons. The frisket is next to be cut, the object of which is to serve as a guard or shield to prevent any ink touching the sheet, except where the type or wood-engraving appears. Upon the face of this frisket pieces of cork are usually secured by paste or melted roller-composition, the object of which is to assist in securing the sheet to be printed so that it shall not touch the forme until the pressure is applied by the platen. This most effectually prevents what are technically called "slurs." It sometimes happens, particularly in expensive publications, or *editions de luxe*, that the forme to be printed will be uneven, that is, very solid or heavy at one part, or very light at another, and the platen is in consequence liable to be thrown out of level bearing. To remedy this, a bearer either of metal or wood is used at the light side of the forme, which bears up the weight of the platen at that side, and so keeps the impression level.

The next and perhaps the most important business is the cutting of the "overlays," as it is upon the proper performance of this part of the work that success to a considerable extent depends. Four or five impressions must be taken of the wood-cut, upon sheets varying in thickness, and at least one should be upon tissue or silver paper; but of whatever substance the paper may be, it must be selected as free from knots or specs as possible.

Take an impression upon paper of medium substance as the foundation of the overlay, and from this sheet the white parts must be all cut away, as should also all lines in the engraving that are unprotected or stand alone. In the next sheet the parts left are to be all the second and heavier tints; and from the third sheet cut out the darkest parts of the shading and the solid pieces

of the block, and paste these pieces upon the second sheet in their correct places. The two sheets are now to be pasted together with thin paste. We have thus a patchwork copy of the surface of the wood-cut, graduated in thickness according to the depth of colour in the picture; the heaviest parts having three thicknesses of paper upon them, while the parts to be faintly printed are cut away altogether. As to the implement with which this cutting-out is performed; the larger blade of a pen-knife, about one third of an inch broad, with the point ground off and fixed in a stiff handle something after the fashion of a chisel, is generally a favourite instrument with pressmen, and is found to do the work well, without tearing the paper, which a sharp pointed instrument might do. Scissors are very rarely used.

The overlay being completed has now with great care to be placed upon the inner side of that tympan which in printing will come next to the forme; and when it has been adjusted so as exactly to fall upon the wood-cut it must be secured in its place by paste. The next impression that is pulled ought to shew the effect of this overlay in bringing out the dark parts of the drawing and making the light parts recede. It is possible that the effect of this overlay may not be all that is desired, and that some further touches may be necessary, and it may even be considered desirable to cut out another thin sheet before the impression is approved. This being accomplished, the pressman proceeds "to work off" the required number of impressions, taking care to use a minimum amount of ink with a maximum amount of rolling, and also to see that the roller, particularly if a composition roller, is in good order. A careful pressman, when employed in work of this character,

should always have a "colour sheet," before him, to serve as a guide with which he should compare his impressions from time to time as the work proceeds. It is almost superfluous to say that the most scrupulous cleanliness should be observed. If it be found necessary to clean the block, spirits of turpentine only should be used, and this very sparingly if the printing be from the original block, as everything calculated to incur the risk of the block warping should as far as possible be avoided. After using "turps" the block must be wiped dry with a clean cloth, and a few impressions pulled upon clean waste paper, so that every particle of moisture should be removed. Upon no occasion should ink be left upon the block to dry and harden. If it be necessary to leave the forme upon the press, it will be safer that the tympan should be put down, and the carriage run in under the platen of the press, rather than leave it exposed to the air and dust. When the impressions have all been printed, the block or blocks should be taken out of the chase, cleaned, and placed upon their edges, and not allowed to lie horizontally. The paper employed for impressions of the best wood-cut work should always be selected of good quality and "clean," that is, free from grit or knots, such as are always found in paper made from straw or other coarse fibre. Any imperfection in the paper coming in contact with the finer parts of an engraving might hopelessly batter it. As a further precaution, and as greatly promoting excellence of work, the paper should be "rolled," so as to present a perfectly even and smooth surface. Paper that is unrolled shews a marked difference in the two sides of the paper, and the pressman will in that case

of course choose the smooth side for printing upon, if his work is only to be printed upon one side of the paper.

The principles involved in the above directions for printing wood-cuts by hand, equally apply when the printing is effected by machine; but there are some modifications and extra precautions necessary in the latter case.

The original wood-cut should never be used at machine, but an electrotype should be obtained; this precaution is necessary in case of any accident befalling the block, as although, with care, such accidents may be mostly avoided, yet when they do occur the injury to the forme is most likely to be fatal. In the case of periodical publications, where speed in the printing is a matter of considerable importance, it is well to be provided with duplicate electrotypes, notwithstanding the fact that a fresh electrotype can now be taken with but a few hours delay. It used to be considered that only platen or flat-surface machines were admissible for printing wood-cuts; but this idea may be said to be now quite exploded, for some of the best cut-work is constantly being turned out from cylinder machines. Indeed, where the machine is of modern construction, and furnished with ample rolling and distributing power, it is not too much to aver that at least as good work is to be had as can be obtained by hand labour, and the inking is more uniformly regulated.

The overlays are made in precisely the same manner as for the hand-press, and are pasted on the impression cylinder, just as overlays of ordinary type are done. All the distributing and inking capability of the machine should be employed, and the vibrator

cut to suit the work ; it being noted that in machine printing, as in hand work, success depends very greatly upon satisfactory and ample inking. Attention duly paid to these matters, combined with the ordinary precautions adopted by an intelligent machine-manager, good work cannot fail to be obtained.

Specimens of superior wood-cut printing are not uncommon even in works that need a large impression to meet the popular demand, and "The Art Journal," printed by Messrs. Virtue & Co., "Picturesque Europe," and "The Art Magazine," printed by Messrs. Cassell, Petter, Galpin & Co., may be instanced. Also, in a somewhat different style, may be mentioned the illustrated periodicals, "The Illustrated London News," and "The Graphic," as exhibiting more or less excellent specimens of wood-cut printing. The palm, however, for superiority in this department must be yielded to "Scribner's Monthly Magazine," a product of New York, which contains some perfect specimens of work. This publication has been the occasion of not a little controversy as to whether the illustrations are wood-cuts or are blocks produced by one of the many methods of etching.

The particular secret (if such a term be admissible) of good wood-cut work or indeed of any fine printing, is the absence of blanket in the impression, and the substitution of "hard packing" instead. This hard packing may be sheets of well rolled paper, glazed board, or even sheets of very thin and finely-rolled metal. It is believed that sheets of brass are employed in America for printing *Scribner*, or *The Century Magazine*, as it is now called. A very soft, almost liquid ink is said to be employed.



Lithography.

BRIEF HISTORICAL SKETCH.



LOYS SENEFELDER enjoyed a privilege, rare among inventors, in living to see his invention of printing from stone brought to its full perfection. Between the years 1795 and 1834 (the date of Senefelder's decease) lithography had been invented and brought almost to its present state of mature development as an important branch of illustrative art.

Born in Munich in 1771, the son of an actor, Alois was at an early age entered by his father as a student in the University of Ingolsdat, but appears always to have been much interested in theatrical matters ; and in 1789, when eighteen years of age, he composed and printed a little comedy "Die Mädchkenner," which brought its author encouragement in profit and applause. The death of his father soon afterwards, compelled him to relinquish his studies at the University, and for two years he devoted himself to his father's profession, to the precarious fortunes of which he added the equally uncertain occupation of an

author. In order to expedite the appearance of his second publication, he became a frequent visitor to the printer, in whose labours he seems to have taken considerable interest, for in his work on Lithography he says, "I thought it so easy that I wished for nothing more than to possess a small printing press, and thus be the composer, printer, and publisher of my own productions." This taste for printing gave rise to a series of experiments, in the course of which accident directed him to the discovery of the method which has since been known by the appropriate name of *Lithography*,—drawing on stone, from *lithos* a stone, and *graphō* I draw. Senefelder's account of his discovery is sufficiently interesting to be given in his own words :

"I had just succeeded in my little laboratory in polishing a stone plate which I had intended to cover with etching ground, in order to continue my exertions in writing backwards, when my mother entered the room, and desired me to write her a bill for a washerwoman who was waiting for the linen. I happened not to have even the smallest slip of paper at hand,—my little stock of paper had been entirely exhausted by taking proof impressions from the stones ; nor was there even a drop of ink in the ink-stand. As the matter would not admit of delay, and we had nobody in the house to send for a supply of the deficient materials, I resolved to write the list in my ink prepared with wax, soot, and lampblack, on the stone which I had just polished, and from which I could copy it at my leisure. Sometime after this I was going to wipe this writing from the stone, when the idea all at once struck me to try what would be the effect of such a writing with my prepared ink, if I could but bite in the stone with aquafortis ; and whether perhaps it might not be possible to apply printing ink to it, in the same way as to wood engravings, and so take impressions from it."

Two highly important parts of the process were thus discovered ; and it only remained for Senefelder to notice that deep etching was not essential, inasmuch as the natural want of affinity between the grease of

the ink and water was alone sufficient to render the invention practicable.

The proverbial inventor's trouble—want of means—soon interposed to hinder the progress of Senefelder's experiments, and in his difficulty he was tempted, by a promised bounty of 200 florins, to offer himself for enlistment in the artillery, as a substitute for a friend. In consequence, however, of his not being a Bavarian by birth, his services were declined. He returned to Munich much disappointed at the failure of his plans, when by chance he was introduced to a musician of the Bavarian Elector's band, and the result of this acquaintance was that the new invention was first applied to the printing of music. The composing, writing on stone, and printing twelve songs, was accomplished in less than a fortnight, and the cost of 120 copies was about 30 florins. The entire impression was afterwards sold for 100 florins. A copy of the work thus produced was exhibited to the Electoral Academy of Sciences, in the hope that that body might be induced to afford him some pecuniary assistance, to enable him to add to his appliances a press more suitable than an old common copperplate press which he had previously used. The Academy presented him twelve florins !

In 1799 the King of Bavaria having granted to him the exclusive privilege of practising the Art for a period of fifteen years, Senefelder appears to have in some measure relaxed in the strict caution with which he had hitherto preserved the secret of his Art ; and, although all the difficulties were not yet overcome, from this time the invention made rapid progress towards successful development.

The printing of music, it has been stated, was the first work to which the new invention was applied, and out of this employment arose the effort after productions of a pictorial character.

"A musical composition," to quote again from Senefelder's work, "on the Conflagration of New Otting, in Bavaria, which was printed for Mr. Lentner, with a vignette representing a house in flames, induced Mr. Steiner to have some small drawings for a catechism printed on stone. As drawings they were but indifferent, but he nevertheless encouraged me to try whether the new invention might not be applicable to the higher departments of the Art. This gentleman, with the exception of M. André, of Offenbach, was the only person who thus reasoned. Lines and points of any degree of fineness and strength can, according to this new manner, be produced on stone; consequently drawings resembling copperplate engravings are to be produced in a similar way; and if we cannot yet succeed in producing them, the reason of it is not to be looked for in the insufficiency of the Art, but in the want of practice and experience of the artists."

In 1801 Senefelder visited London, and in that year he obtained a patent for "a new method and process of performing the various branches of the art of printing on paper, linen, cotton, woollen and other articles." He had the mortification, however, upon his return to Bavaria, of finding that his patent was being extensively pirated: so rapid indeed was the spread of the art, that by the year 1809 there were in Munich alone six lithographic printing offices besides Senefelder's. The art, upon its introduction to London by the inventor, in conjunction with M. Philip H. André, was

known by the name of *Polyautography*, and one of the first publications was that entitled "Specimens of Polyautography by André, 1801." This work consisted of a variety of ink drawings by some of the most celebrated artists of the day, including Benjamin West, R.A., Henry Fuseli, R.A., Thomas Stothart, R.A., James Barry, and several others of eminence. Most of the English artists, however, soon abandoned the new work without giving themselves the trouble of studying its real capabilities, preferring the easier course of condemning the invention rather than acknowledge their own want of experience of its necessarily peculiar manipulation. There were not wanting, however, patient workers willing to pursue the study and test its advantages, and among this number must be mentioned Francis Nicholson, an artist of celebrity as a painter in water colours; Mr. Ackermann, who translated into English the inventor's book "Elements of Lithography;" Mr. Charles Hullmandel, who, besides being the author of works on the subject, claimed an improvement, which he styled "Hullmandel's litho-tint process;" Mr. Michael Hanhart, the elder; and Mr. Louis Hague.

The first application of lithography to the printing of maps was by Colonel Brown, in 1808; and the first map was a sketch of Bantry Bay, produced at the Horse Guards, where the printing of official circular letters soon gave further occupation to the lithographic press.

Of personal particulars of the inventor there are not many, but to such as have been given may be added his unaccountable dread of having his portrait taken, originating in a presentiment that his decease would be the immediate consequence. His likeness was therefore

in the first instance taken by stratagem, and was drawn upon stone by his intimate friend Mr. Hantstaengl. The artist was subsequently induced to ask Senefelder to give him a sitting in order that the sketch might be satisfactorily completed. To this request, as may be imagined, a very reluctant consent was given; but before the sitting was concluded, Senefelder was seized with illness, which in three days proved fatal. The portrait thus obtained is consequently the only authentic likeness of the inventor of lithography, but it has been frequently reproduced, and is therefore familiar to all who are interested in the subject.

To complete this brief account of the invention of lithography and of its discoverer, it only remains to state that a public memorial has been erected by subscription at Munich, opposite the house in which he died, on the Sendlinger Platz. It was unveiled on the 6th November, 1877, thus commemorating the 106th anniversary of his birth.

LITHOGRAPHY: PRACTICAL DIRECTIONS.

WRITING OR DRAWING MATERIALS.

ALL the necessaries for the draughtsman or artist are procurable of the dealers in lithographic materials, and it will here be supposed that these requirements are at hand.

The preparation of the writing ink is the first consideration.

The saucer to contain the ink is to be made warm and the stick of prepared lithographic ink is to be rubbed over the surface of the saucer until a thin coating has been deposited; a very small quantity of *distilled* water being added to render it sufficiently fluid to be worked with freedom. The degree of fluidity must be regulated according to the work to be performed, and this knowledge can only be acquired by experience; but it may be premised that when for use with a pen it should be thinner than if the drawing instrument be a brush. For drawings of a freehand character, artists prefer as a rule to use a brush. The best description of brush for the purpose is red sable, and the artist will find it necessary to cut the brush to suit his work.

There are two methods employed in making drawings for lithography, one by drawing upon the stone direct, and the other by drawing upon transfer paper, from which the drawing is transferred, by a mechanical process, to the stone. This latter method is only used for work to be printed in black, or in one colour, while for chromo-lithography, or printing in several colours, the drawing is invariably made upon the stone direct.

The transfer-paper used for drawings should be thicker than that used for writing or commercial work. It is sometimes suggested that the transfer-paper should be stretched upon a drawing-board, by damping the unprepared side of the paper, and while damp, pasting or otherwise securing the edges to the board. In practice, however, it will be found that this is unnecessary, for the transfer-paper when purchased is perfectly flat, and not liable to "buckle," from the transfer

composition which it holds. On no account should moisture be applied to the prepared surface of the transfer-paper.

Whatever the instrument with which the drawing be made, it will be found desirable that thick lines or strokes should, as far as possible, be made with what may be called "the first intention," and not by passing the pen repeatedly over the same line, as the moisture of the ink is apt to unsettle the composition upon the surface of the paper, and injure the effect.

Where the drawing to be made is to be fac-simile, -or to be a copy either enlarged or reduced, some slight differences of treatment will have to be observed. For making a fac-simile copy, tracing transfer-paper will be required, and as this paper is very much thinner than ordinary transfer-paper it will be found somewhat difficult to distinguish the prepared side of the paper from the plain. The drawing to be copied is first to be placed upon the drawing-board, then lay the tracing-paper over it, and secure both to the board by drawing pins. The subject is then carefully traced, and when completed the tracing is removed from the board and passed on for transfer to the stone for printing. If, however, after tracing the outline the artist should prefer to adopt his own ideas as to the filling in, or shading, he can readily do so by introducing a sheet of hard, white opaque paper between the tracing and the original drawing. By withdrawing this white sheet he can compare his work with the original from time to time as it progresses. Old MSS. or antique drawings are all copied in the way here described, the artist choosing pens with fine or coarse points, or brushes, according to the nature of the work to be produced. For enlarging or reducing

the drawing, it is usual to put the drawing into a picture-frame with the glass marked out in squares by equi-distant lines scratched or engraved upon the glass in opposite directions; then to use transfer-paper similarly ruled. It will be seen that by regulating the distance between the lines on the transfer-paper, either larger or smaller squares will be produced. The artist then copies into a square on the paper so much of the drawing as is included in a corresponding square of the original: by this means an enlarged or reduced copy is produced. There is also a mechanical method of enlargement or reduction, but this is only applicable to commercial work and will not therefore need further description here.

In DRAWING IN INK upon the stone direct, the surface of the stone should be polished. The artist usually works from a design or sketch previously made upon paper, and his first care will be to have a perfectly-traced outline upon the stone. A tracing is first made upon ordinary tracing paper and laid face downwards upon the stone, a sheet of red-chalk paper being placed between the tracing and the stone. The reversed outline is now re-traced with a steel point, and if the lines have been firmly drawn in the original tracing, a complete outline in red chalk will be found left upon the stone, sufficiently distinct to guide the artist in drawing the subject in ink either with pen or brush. In making this tracing it will be found desirable to use an HHH pencil, as a line at once fine and decided is required. When laying a tracing upon a grained stone for chalk drawings, the red-chalked sheet should be lighter so that the red outline left on the stone may be fainter than when used upon a polished

stone. In working either upon stone or transfer paper with a brush, a little practice will be found necessary, as the manipulation is somewhat different from that adopted in water-colour or sepia drawings. The brush after being dipped in the ink must be worked round and round upon the edges of the saucer until a fine point is produced when it will be in proper condition for use. In water-colour drawing the colour, as is well known, is laid on in a wash from a well-charged brush, but for lithographic purposes the aim is to produce a fine clear line from a partially exhausted brush. From this it will be inferred that the lithographic brush requires frequent replenishing. The novice must not be disappointed if he should find that the satisfactory use of the brush does not prove one of the things that come by nature. Not only is the edge of the saucer in requisition for bringing the brush to a fine point, but the edges of both transfer-paper and stone are made to contribute to the same end, as may be observed by watching an artist at work. The best description of brush is a red sable, but bearing in mind the very different treatment of a brush for lithographic purposes, artists "improve" the brushes they purchase until to the uninitiated they would seem to be completely spoilt.

In ink work, shading is performed by lines, more or less thick, which may be crossed and recrossed at different angles; for masses of shadows the drawing is "put in" solid, as in the deep shades of a wood engraving, and if, upon proving, this should appear to be too heavy, a roulette passed over it will tend to reduce it.

For mechanical drawing or architectural work, steel pens, or what are called by the makers "lithographic

pens"—which are small steel nibs with very fine (almost hair) points—will be found absolutely essential, as extreme fineness of line is necessary. The outline being placed upon the stone, in a reversed position as compared with the original, it will be convenient for the artist so to arrange the original drawings as to obtain a reversed reflection. This is done by suspending a looking-glass before him, with the original placed with the back to the operator so that he can only see the reflection—of course reversed—in the glass. The necessity for the objects being reversed upon the stone for the purpose of printing will be obvious. Glass silvered by the chemical, will be found preferable to that done by the ordinary method, as giving but a single instead of a compound reflection. Stippling, which is the employment of a series of dots as a means of shading, is very useful, and when introduced with care and judgment, imparts a soft tone to the drawing. Parts of the drawing that may not satisfy the taste of the artist, can be taken out by scraping the stone, but caution must be observed, or a hole more or less deep will be the result, and this will prejudicially affect the printing. If the correction occupies much space it will be better to use snake-stone to restore the polished face of the stone, and for which purpose snake-stone pencils are procurable.

A few cautionary observations will prove useful. Both transfer-paper and stone readily absorb any greasy or moist exhalations from the hands ; it is therefore important that the hand should not rest upon the stone unless it be protected by a sheet of paper. If the stone, as will happen in cold weather, requires drying before commencing to work upon it, let it be placed with its

back to the fire for a short time. Rulers also should, for similar reasons, never be used upon the stone without a sheet of paper being placed underneath. A hand-rest is another contrivance for the same end that will be found serviceable, and may be made by laying a thin board across the stone, supporting the ends upon a pad or block so as to raise the board clear of that part of the stone upon which the work is to be drawn.

For CHALK DRAWING, the stone to be used must be "grained," and the drawing implement or material be a crayon or lithographic chalk. The surface of the stone being rough or grained, causes the chalk used in drawing to yield more of its substance to the surface of the stone, and for this reason the grain selected should be fine or coarse according to the nature of the work in hand. The graining the stone is performed by rubbing "graining sand" over the face of a stone with an instrument called a "levigator," or a piece of stone ; or if two lithographic stones be used with the sand between their faces, both stones will become equally grained. Water is necessary to be used with the sand in this process, and both sand and water will need to be frequently renewed until the required grain is produced. Sand of various degrees of fineness can be procured, and will be selected according to the quality of grain desired. When the graining is completed the stone should be thoroughly washed and made free from all particles of sand and placed to dry.

It is, if possible, of greater importance in using a grained stone to be careful that the hand does not touch the stone, than it is when writing upon a polished stone, as the stone when grained is far more susceptible

of grease and dust. For this reason, as soon as the tracing is laid down upon the stone, and before the artist commences to work, the stone should be covered with a sheet of clean paper secured at the edges of the stone. Beginning at the left-hand upper corner, a piece of the paper is torn, like a flap, so that as the work progresses the part of the stone not being operated on is protected from dirt. Especially careful should the artist be not to allow any scrapings of his chalk to settle upon the stone, as, if left there, they will be sure to appear in the printing. In giving point to the crayon use a knife, but reverse the operation of pointing a pencil, by cutting from the point upwards; afterwards rub the crayon on the edge of the stone, or on some rough paper. Turning the crayon round during the operation gives a good taper point, and is the best method of restoring the point as the crayon becomes worn away with use. Chalks of different degrees of hardness can be procured, and the advantage of selecting crayons according to the nature of the work in hand, will readily be understood. Even in chalk drawings an occasional use of ink laid in with the brush will aid the effect to be produced. In tinting, the crayon should be held in a slanting position, so as to touch lightly upon the points of the grain upon the stone. This will give the first or lightest tint. To add to the depth of the shadows a softer and stronger chalk may be used, and by holding it in a more upright position in the hand the chalk will be deposited between the points of the grain as well as upon them. In taking a first impression or proof from the stone when finished, it will be well to use a slightly tinted paper, approaching as nearly as possible to the neutral colour of the stone, as if a clear

white paper be used the effect realized upon the paper will show a marked difference from that which the artist has been endeavouring to produce upon the stone. Any specks or other imperfections which appear in this proof may be removed from the stone by a needle-point, and this instrument will also be found useful to "cut up" any shadows that may appear too heavy.

Chalk drawings may also be made upon *grained transfer-paper* and transferred to the stone in the same manner as that employed for the ordinary transferring of ink work.

The important process of "etching"^{**} has next to be performed, and the *rationale* of this process is as follows: The chalk, or crayon, being mixed with saponaceous matter by way of vehicle, is soluble in water, and would naturally spread under the damping process used in printing. The stone being washed by dilute nitric acid being flooded over its surface, the saponaceous character of the chalk is destroyed, and it is thus rendered fixed. This biting also serves the further purpose of clearing away any dirt that may have settled upon the stone, as it slightly removes the surface of the part of the stone not covered by the chalk. There are three methods of biting: one by placing the stone in a trough or bath; another, by making an artificial bath upon the surface of the stone by walls of wax built upon the stone in the margin or outside the drawing. The third method, which is that most usually adopted, is by using a preparation of acid

* *Etching* is here used in the *technical* sense employed by lithographers, and not in its correct signification. See the article on "Dawson's Typographic Etching," p. 149.

diluted with gum water, and applying it to the surface of the stone by a wide flat brush. The gum assists the fatty matter of the lithographic chalk to combine with the lime of the stone, thus forming an insoluble soap, at the same time that it imparts to the uncovered portions of the stone a tendency to repel the ink in those parts. The work upon the stone is also, by this application of gum, rendered more durable, and thus capable of yielding a larger number of impressions.

Whichever method of biting be adopted, the acid must be carefully washed from the stone after the operation; the stone is to be then gummed over and allowed to dry, when it will be ready for the printer.

LITHOGRAPHIC PRINTING.

THE lithographic press differs in construction from both the copper-plate and the type press, but more nearly resembles the former. Senefelder, the discoverer of the art of lithography, also invented a special press for the purpose of taking impressions from lithographic stones. This invention was secured by a patent dated 1801; and the principle of Senefelder's press, with but slight variation, is the same as that adopted at the present day.

The stone from which impressions are to be printed is placed upon the bed of the press and secured in its place. Lithographic stones, as is well known, are not all of the same thickness, neither does it always happen

that a stone is of uniform substance throughout. Unless the surface be raised to a perfect level the pressure of the "scraper," or head of the press is very liable to break the stone. To prevent this, which is not by any means an uncommon accident, it is usual to "back" the stone by bedding it on another and larger stone with plaster of Paris. The plaster, being in a liquid state, gives a perfectly level bed, and will soon set. Notwithstanding all the precaution, it may be that the stone will give a fainter impression at one corner than at another, and an "under-lay" of thick soft paper will have to be placed under that part of the stone. The face of the stone is first to be damped with a sponge dipped in water, and as the drawing has been made with a greasy material, the water only affects the part of the stone that is not occupied with the drawing. As the stone is slightly porous, it readily absorbs the water and effectually resists the ink, except where the drawing has been made. The ink-roller is made of leather stretched round a wooden stock with two projecting pieces which serve as handles. The workman, in using the roller, holds in his hands small shields, made of glazed board or leather, which protect his hands from the friction caused by the roller being made to revolve.

Upon the stone thus inked a sheet of paper, face downwards, is placed, and upon this the tympan is let down, and by means of the lever handle the stone is raised to such a level as will bring it into contact with the scraper. The stone being thus in position the handle of the windlass is turned, which gradually propels the stone under the scraper, and as soon as it has been passed under, the lever is again liberated, the

stone drops to a lower level, and the bed is brought back to its first position by hand, for the tympan to be lifted up and the sheet withdrawn. There is also a screw at the head of the press to assist in regulating the pressure of the scraper.

The process of inking, &c., has to be renewed for every sheet to be printed.

Such is the process of lithographic printing by hand; but within the last twenty years machines have been invented to perform all this manual labour by the aid of steam as a motive power. In these machines the scraper of the press is dispensed with, and in its stead is a cast iron cylinder with a blanket stretched upon its surface. The machine is in all its essential details very similar to that used for type printing, and in some cases—Parsons & Davies' machine for instance—are easily convertible to whichever description of printing may be required.

For the purposes of chromo-printing, where absolute "register" is so essential, there are appliances, applicable to machine as well as hand labour, to ensure the printing of one colour falling exactly in its proper place to give the effect desired in the design or picture to be printed.







Cassell Petter & Galpin, London.

THE R

(AFTER A PAINTING BY



Th. Dupuy & Fils, Paris & London.

SCUE.

(EDWIN LANDSEER.)





CHAPTER IV.

“Chiaro-Scuoro,” OR Chromo-Printing.



THE method of producing pictures in a variety of tints was at first termed *chiaro-scuoro*, and sometimes *engraving en camaieu*. In later times the method has been extended to combinations of several colours and is designated *chromo-printing*.

A print in *chiaro-scuoro* is an engraving or design produced by using two or more different blocks, each block being printed in a separate tint. In the earliest specimens the plan was confined to gradations of the same tint or colour, producing an effect very similar to a sepia drawing. When three printings were thus employed it was customary to use one for the outline,

—or technically the “drawing,”—of the subject ; a second block contributed the lighter shadows, and the third gave a tint or tone over the whole of the picture, excepting, of course, the “high lights” which were produced by simply exposing the white of the paper. This third printing also assisted at the same time to enhance the deeper shadows.

Even in the early days of the employment of this method the outline of the subject was not unfrequently printed from a copper-plate, the colours, particularly in illuminated initials, being superadded by wood blocks. In other instances again, all the printings were from copper-plates engraved in intaglio. This method was adopted by Heinrich Goltzius ; and it was also practised by Abraham Bloemart.

Peter Schoeffer’s initial letters it is stated, on the authority of M. Didot, were produced in two colours by one action of the press. This was effected by inserting the block for the second colour, after being separately inked, into the cavity left in the block used for the first colour. Mezzotint engraving was also used for the like purpose ; but as such plates are not capable of yielding any considerable number of impressions it was soon ascertained to be inapplicable.

The discovery of the method of producing prints in *chiaro-scuro* is generally attributed to Ugo da Carpi. No earlier date than 1516 has however been found in connection with the work of this artist ; while some indeed give ten years later as the correct date. Dr. Willshire, in the work to which reference has already been made, gives, on the other hand, 1506 as the date of the first German *chiaro-scuro*. He also mentions a print in three blocks “after a design by A. Burgkmair,

worked-off by J. Dienecker," with the date of 1512. Both dates are anterior to the period assigned to Da Carpi's work. At the same time it is but just to acknowledge that this artist attained considerable distinction by having contributed very greatly to develop and cultivate this particular branch of the art. Mention should also be made of a print bearing date 1509, by Lucas Cranack, the subject being "Repose in Egypt," which establishes the fact that this artist was one of the earliest who practised this method.

Andrea Andreani invariably adopted the original plan of employing an outline block ; but Ugo da Carpi introduced the practise of dispensing with it, and his example, in this respect, is followed at the present day.

From Walpole's Catalogue of Engravers we learn that Edward Kirkall combined "etching, mezzotint, and wooden stamps" in the production of his *chiaro-scuros* ; but although he has the credit of being the first to practise in England this peculiar form of art, it cannot be ascertained that he achieved any great distinction as an artist. About 1722 Kirkall published twelve *chiaro-scuros*, engraved after designs by the old masters.

Three circumstances are worthy of notice arising out of these necessarily brief historical notes. One is the foreshadowing by Kirkall of the process which in modern times became associated with the name of Baxter, and to which allusion is more particularly made in a subsequent page. Another is the fact that the most recently approved method of laying-out the blocks for chromo-printing, that of dispensing in printing with the outline block, should have been adopted by the

artist, who if not the first to discover, was at least among the first to practise *chiaro-scuro*. Lastly, it may be mentioned that a compound printing machine was invented by Sir William Congreve with the object of preventing forgery. By this machine a commercial design in two colours could be printed by one operation. The two blocks are reduced to a different level during the operation of inking, and subsequently, by a mechanical arrangement, brought to the same plane for taking the impression. This invention is unquestionably a development of the plan adopted in the case of Peter Schoeffer's initial letters previously mentioned.

There is another description of colour printing which is by some supposed to be among the lost arts, and to which recent events have drawn especial attention. This is the work of printing from copper plates in the various natural colours. Some very favourable specimens of this description of art-work were recently shown at the "Loan Collection of Engravings and Etchings by Francesco Bartolozzi." Upon close examination there can be little doubt that in many instances the plate, as it appears printed in colours, was produced at a single impression. It would appear that the printer must have applied his colours to certain portions of the plate by means of brushes, and when the plate was thus charged with its various tinted inks, it was placed upon the press and printed in the ordinary way. Bartolozzi's stippled plates lent themselves in a very happy way to this treatment, and some of his pictures, printed in colours, have a charming and at the same time artistic effect.

In several of these pictures the draperies and accessories were printed in a neutral tint, while the faces and naked parts of the figure appear in the flesh-coloured hues of nature. In others, again, portions of the draperies have been coloured by hand in wash, while the flesh tints were printed.

A caution to the collector, against imposition in the matter of Bartolozzi's coloured prints, which is given by Mr. Andrew W. Tuer in the Introduction to the Catalogue of the Exhibition already referred to, may usefully be here reproduced.

"Unscrupulous vendors of reprints now foist upon the public engravings from worn plates printed in a uniform light tint, and afterwards hand coloured; but as the whole of the ground, including the spaces between the dots or specks, is coloured, with the stippled work showing through, this spurious rubbish is not difficult to detect."

It must not be supposed that the method of producing printed coloured pictures from copper plates originated with Bartolozzi. The specimens of such work in the Bartolozzi Exhibition have simply brought the matter into more prominent notice; but there is no question that this style of chromo-printing was known and practised long before the time of this great modern master of stipple engraving. That it is not one of the "lost arts" may be conclusively proved by the productions in coloured photogravure issued by the house of Goupil et Cie. at the present day.

BAXTER'S PROCESS, as it was called, was introduced by George Baxter about the year 1835, and was described as printing in oil colours. Some of the most important specimens are to be found in the Pictorial

Album, a quarto volume published by Chapman and Hall in 1837. The method pursued by Baxter was to obtain a steel engraving of the subject, such an one as would furnish the complete picture if printed in the ordinary way in black ink as a book illustration. This plate was printed in a neutral tint upon a copper-plate press, and became the ground-work of the chromo picture. Blocks were then cut of the precise shape of the different colours and shades, and these were printed upon the engraved picture at an ordinary type-press. Pictures produced in this way needed a considerable number of different printings to produce the required result—as many as twenty have frequently been used,—but no particular artistic skill was necessary in the preparation of the blocks. Baxter's method, though it produced some very good cabinet pictures, was altogether too tedious to be of any value in a commercial sense, and it has now wholly fallen into disuse.

Another plan has been adopted and carried out with some considerable success, in which the whole picture is made by a series of wood blocks printed in different colours, the entire outline being printed in black and the colour blocks being printed upon the outline to complete the picture. The result has a particularly neat and pretty effect.

The coloured illustrations which form the supplements to the *Illustrated London News*, *The Graphic*, and similar periodicals, are produced in yet another way, and are a combination of wood-cuts and raised or surface aquatints.

In undertaking such a picture, the first care is to arrange a scheme of the number of printings which it



*As I was going up Pippin Hill,
Pippin Hill was dirty;
There I met a sweet pretty lass,
And she dropped me a curtsey.*

KG.

KATE GREENAWAY.

EDMUND EVANS.



will be necessary to use, and then to provide a key-block which shall be engraved so as to give all the outline or "drawing" of the picture. When this block is ready, as many copies are struck off as will be required for the various coloured blocks, and these are "laid down" upon blocks of wood or metal as may be best suited for the different colours to be printed, it being noted that scarlet, crimson, and some others must be printed from wood, most of the ordinary metals interfering prejudicially with the purity of ink of these tones. The tints are generally the first colours to be printed, beginning invariably with yellow as being an opaque colour. After this, flesh colour, if a figure subject; or, the lighter shades of blue for the sky, if a landscape; and so on until all the colours have been applied. What is technically called "register"—or the correct overlapping of one colour upon that previously printed—is a most important consideration in chromo work, whether produced from stone or by surface-blocks; and in the latter process it is usual upon the margin of the first forme to place a series of ten or more points, so that with the printing of this forme a series of holes may be perforated in the margin of the paper as guides for placing or "pointing" the sheets in the future workings. If the picture is to be printed at platen machines, the method of pointing is almost identical with that adopted at the hand-press: a pair of points are secured upon the frisket (in hand-press it is upon the tympan) and the sheet is kept in its proper position by placing the holes which have been selected upon one pair of the points. Points are also arranged upon a similar plan upon cylinder machines, and the mechanism of these machines has

been so materially improved in this respect of late years, that equally satisfactory register may now be obtained by them as by pointing on platen machines. Even if a platen machine be used, the first colour may well be printed from a cylinder. It should be understood that it is desirable for some time to elapse between the printing of the various colours, in order that the ink of the first printing may have time for drying before the second printing be attempted. Something should here be said about the preparation of the ink. The ordinary colours, such as are suitable for commercial work, can be all procured from the ink makers; but as in the production of printed pictures considerable exactitude as to the precise shade of colour is necessary, the printer invariably makes the ink for himself. The colour in powder is purchased, and then, by the addition of the proper quantity of prepared varnish (which is supplied by ink makers), the colour is toned down to the exact shade required. The ink, after mixing, is passed between steel or marble rollers to be ground before being used, by which means not only are the materials well mixed, but the ink will be found to attain a more uniform colour throughout.

It occasionally happens when all the printings which were at first arranged have been accomplished, that the picture lacks something, from the several printings having failed to produce *all* the effect that was anticipated. In this case the mode of overcoming the difficulty is to add another printing; in some cases the deficiency may be supplied by printing one of the blocks again, a grey for instance, in a slightly tinted varnish.

Many of the practical observations here given will be found applicable to chromo-printing from lithographic stones; indeed, by whichever process chromo-printing may be performed, whether by lithography or by surface blocks, the object sought is the same, and the principle involved in the method of carrying out that object is equally suitable. For chromo-lithographic purposes it must be understood that the drawings upon the various stones are, for the most part, made in chalk.

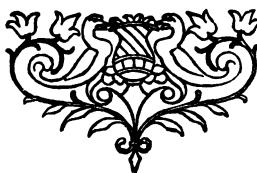
With respect to the key-stone or key-block, the most approved method is to use this simply as a guide for drawing the stones or blocks for the various colours, and not to use it as a separate and independent printing. For the purpose of supplying such sharp indications of drawing as may be required, a "touch" stone or block, printed in a dark brown or black ink, may be used with considerable effect.

For the production of portraits, lithography has long been acknowledged as peculiarly adapted, and for a like purpose chromo-lithography is now employed with considerable advantage.

Mention should also be made of the elaborate invitation tickets for the City banquets which are, in many instances, entitled to be considered artistic productions. Chromo-lithographs, too, are very largely used, when framed, as ornaments for the walls of private residences.

Playing cards are mostly printed from raised blocks. The backs of these cards are produced in considerable profusion of ornament—floral, Arabesque, Japanese, Grecian, &c.,—and have for many years given scope to artistic taste. These designs are printed from plates as well as blocks.

Christmas and birthday cards are a more recent form of chromo printing, which, in the short time since their introduction, have given rise to an important and extensive branch of business, several large houses having made it a speciality. Many of these productions are attractive in a very high degree, and, indeed, may be said to take rank as works of art. Recently, considerable sums have been expended by the leading firms in competitions for the best designs. It is believed that some of these cards are produced from raised blocks, but by far the greater part of them are due to the work of the lithographer.





PART II.

CHAPTER I.

Engraving by Chemical or Mechanical Processes.

INTRODUCTION.



FTER a lapse of four hundred years,—during which time the engravers have had the field pretty much to themselves,—it need not be matter of surprise that the constantly increasing demands for cheap illustrated literature should have suggested some new methods of illustration, less expensive and more rapid in production than wood engraving. As engraving on copper or steel has had to give way to wood-engraving for purposes of popular illustration ; so it is reasonable to believe will wood-engraving be superseded by some

other methods of preparing pictorial illustrations of a certain description. Not a few new methods, or "processes" as they are called, have already been devised, mostly modifications of etching upon metal plates, where the ordinary work of the engraver is replaced by submitting the plate to be operated upon by acid after the subject has been drawn upon it or transferred to it. This has hitherto proved the most successful form of process, but there is another class which is based upon the employment of the battery, and where the object is to build up metal upon the whites of the picture, so as to form a mould from which a printing plate may be cast. Although the result in both these methods is the same,—the production of a block in which the subject or drawing is in relief,—yet the modes of procedure are diametrically opposite. One builds up the "whites," while the other bites them away. The most important of these processes will be here given somewhat in detail; it being premised, however, that several of them differ but very slightly from each other, and that nearly all have some real or fancied peculiarity or secret which the possessors are wishful to preserve.



ZINCOGRAPHY.

THIS is the method of producing a raised block by operating upon a plate of zinc by means of acid, and is adapted to many descriptions of drawing.

1.—In the first or most frequently adopted method, the drawing is made on transfer paper with lithographic transfer ink. That which bears the name of "Vanhymbeck's autographic transfer ink" is very

ZINCOGRAPHY.—Reproduced from a sketch of Lake Starnberg, three yards long, in the possession of the Princess of Walde.

BY THE DIRECT PHOTO-ENGRAVING COMPANY.

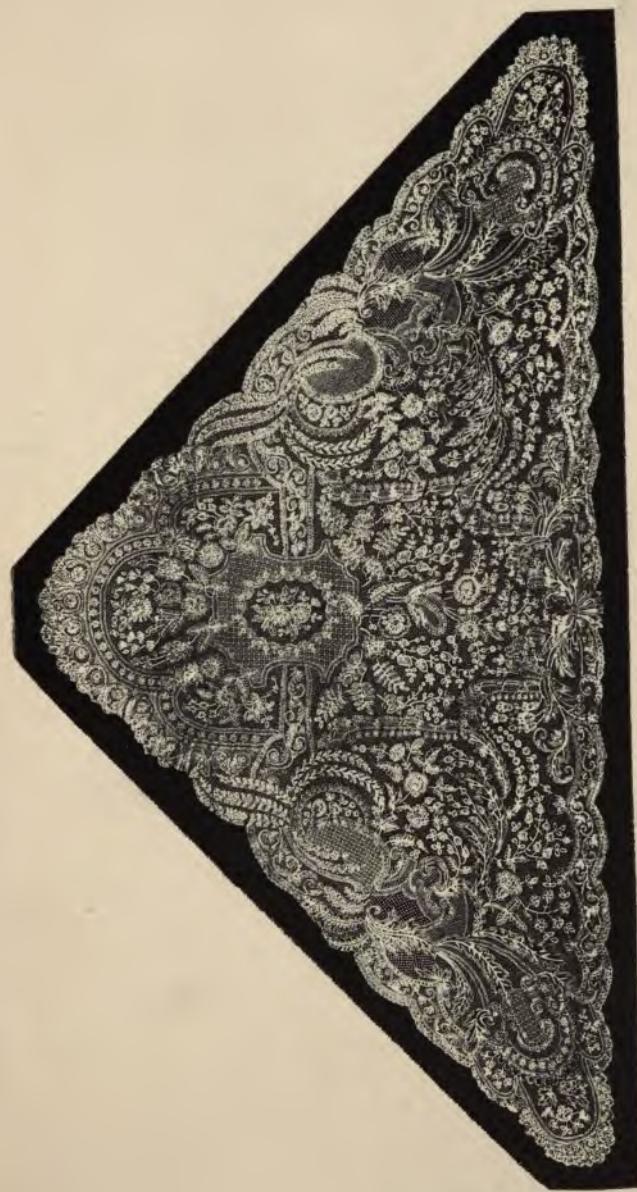
other consists of *gummed* paper, which is pasted upon the "process" or "copy" and taken from the artist's original drawing or sketch, where the artist's name is written by indicating the place where the artist has been present on it. This has the advantage of giving the artist a record of his work, and also of giving the artist a permanent record of his work, which may be used. Another method is the *copy*—the process by which the artist or painter uses the modes of procedure, any manner, holds up the "old," while the new. The use of such a copy, however, gives another to others to copy, however, the artist of course retains his own original, and also copy all his original pencil work, while the original is given to another.

ETCHING AND DRAWING

This is the method of producing a drawing by operating upon a plate of zinc by means of acid, and adapted to many descriptions of drawings.

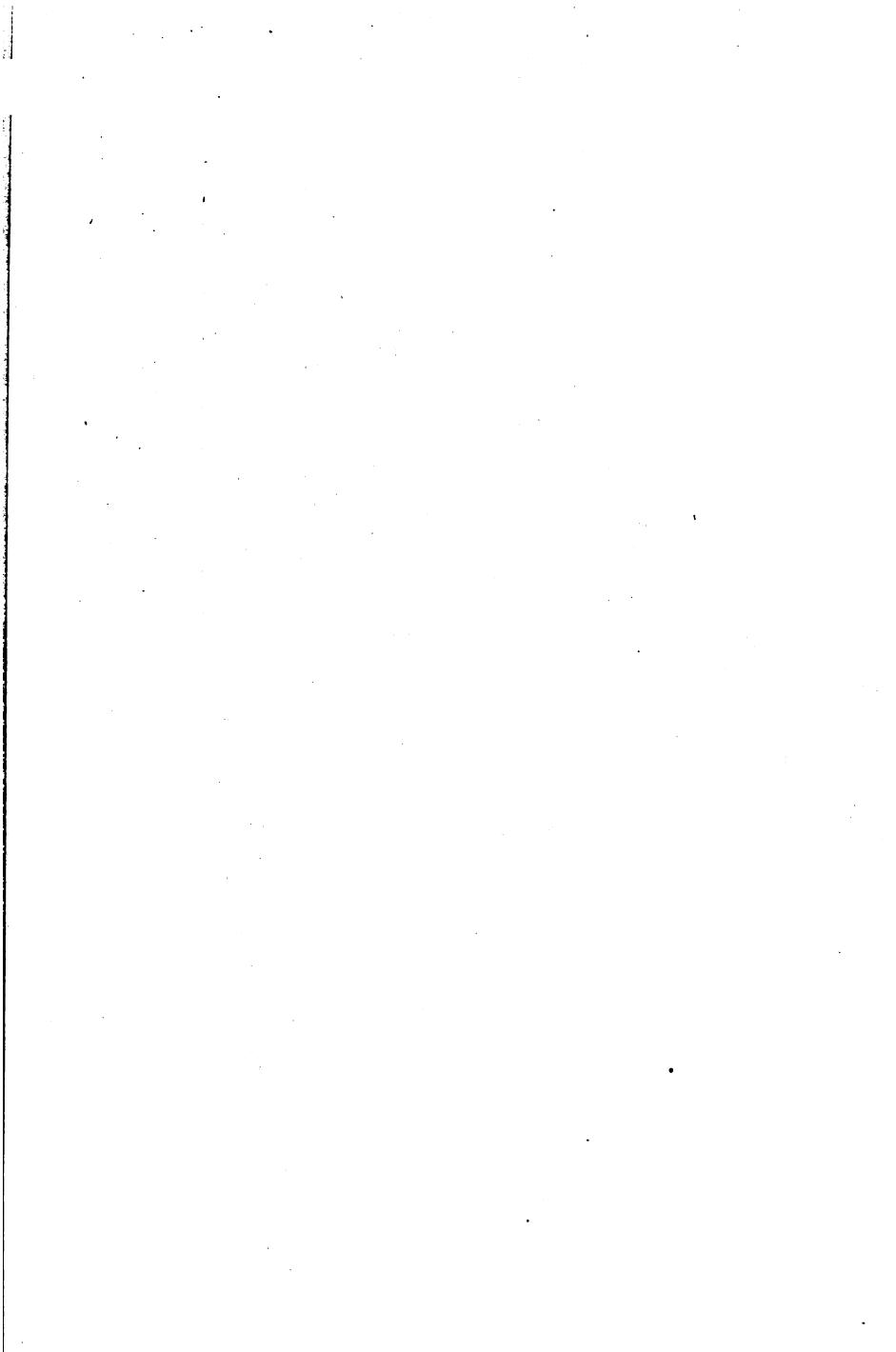
1.—In the first or *etching* method, the drawing is made on zinc by means of an etchable transfer ink. This ink is made by

"Vandyke's autographic transfer ink."



ZINCOGRAPHY.—Reduced fac-simile of Lace Shawl, three yards long, in the possession of the Princess of Wales.

BY THE DIRECT PHOTO-ENGRAVING COMPANY.



generally approved for this work. The French transparent transfer paper may be recommended, and the drawing should be "put in" with a sable brush, as mentioned in giving Practical Directions for the Lithographic Artist. The reader is referred to the chapter just mentioned for some hints that will be equally useful to him, whether preparing a transfer drawing for process work or for ordinary lithographic drawing. All the effects of light and shadow in this drawing, it must be borne in mind, should be produced by means of lines, more or less heavy or close together, or the lines may be crossed and re-crossed at any angle.

2.—Where the effects of lithographic chalk-work are desired, GRAINED TRANSFER PAPER may be advantageously employed, the drawing being made with lithographic chalk. The depth of the solids of the picture will be enhanced by the use of ink in those parts.

In these cases the method adopted is to lay down the drawing at once upon stone, whether such drawing be made on transfer paper in ink or on grained paper in chalk; then to retransfer to zinc.

3.—There is a third description of work applicable to Zincography, which is by taking for the drawing an impression from a copper or steel plate, or from a lithographic stone; but in these cases the impression is transferred direct to the zinc plate.

So much having been said of the method of preparing the drawing, it now remains to give a description of that part of the work which supplies the place of engraving, and has given the name of "Zincography" to the process.

Upon an ordinary prepared zinc plate the subject to be produced is drawn with lithographic ink or chalk, or is transferred to it by the methods previously named. When the drawing is finished, the plate, instead of being handed to the lithographic printer, is submitted to chemical manipulation for the purpose of being made into a block. The plate is first to be "rolled up" and placed in a bath of nitric acid, and bitten until a depth of one-sixteenth of an inch has been attained. As this work of biting proceeds, the plate will require to be rolled up from time to time, and it will be desirable to mix with the ordinary lithographic ink a small portion of Brunswick black, as the danger to be avoided is the tendency which the acid exhibits of undermining the lines of the drawing, and, in some instances, destroying them altogether. This tendency of the acid to bite laterally as well as perpendicularly must be carefully guarded against, and to this end the precaution is taken of keeping the bath in constant motion. It is usual to place the plate in a rocking cradle in the bath, for the convenience of giving it a constant gentle oscillation. It is also essentially necessary to watch persistently the progress of the work, and frequently to repair the loss of the acid-resister by "rolling up." The necessity for avoiding a stagnant condition of the acid-bath arises from the fact that the metal which has been dissolved by the acid has a natural tendency to re-deposit itself upon the plate; still more effectually to prevent which, a feather should be passed over those parts where this re-deposit is most likely to occur. This will have the further advantage of enabling the operator to ascertain the progress of the work without removing the plate

from the bath. All the processes which depend upon chemical action require skill in the manipulation, and even in the most expert hands success is not uniformly attained. It may, however, be mentioned that for fine work dilute acid is employed, the pure acid being reserved for coarse work, or the coarser parts of a fine picture.

The plate, having been under the action of the acid long enough to secure the drawing in relief to an appreciable extent, is washed and, after mounting, is fit for the printer. If, however, it is not intended to print from the original plate, it can now be passed to the electrotyper, who will endeavour in his wax mould to rectify any deficiency in depth, particularly in those parts where large spaces are left.

By this process chalk-work, as well as ink-work, can be produced in relief, but the latter is more easy of accomplishment and generally more successful in its results.

Zincography is the most generally adopted of all the various methods of chemical production of blocks in relief, and for commercial work it is possibly the most useful. It will be observed that a great difference exists in the work produced by the various firms who practise Zincography. This difference cannot be traced to any corresponding variation in the methods used, which are, it is believed, in every case identical; but is simply the indication of greater or less care or skill in the individual operator. The chemical agent employed is not only a powerful worker, but it is also a very uncertain one, and requires the most watchful attention, as, in a few seconds, irretrievable injury may be done to a picture by carelessness.

The weak place in Zincography is the difficulty of producing variety of colour and, consequently, "distance" in a picture. For the most part subjects produced by this method are too "flat" in appearance.

Attempts have likewise been made to bite the lithographic stone itself for the purpose of providing a mould from which to produce an electrotype plate, but the porous state of the stone prevents sharpness of effect in the lines of the picture. This method has therefore fallen into disuse.

M. DULOS' PROCESSES.

A PLATE of copper is provided and a lithographic drawing is transferred to its surface. If the plate be now attempted to be silvered in the battery, a coating of silver will be deposited upon the untouched parts of the copper. Now remove the ink of the transfer with benzine, and the picture will be shown on the naked copper, while the rest of the plate retains the silver. At this stage of the work, the plate must be submitted to a bath of ammoniacal sulphate of mercury, and the silvered roller passed over its surface for four or five minutes. Mercury is precipitated upon the silver, and the sulphuric acid leaves the mercury to attack the exposed copper ; the plate, when cleaned, is ready for the copper-plate printer.

To obtain a relief block, use a silvered copper plate : then transfer the design in lithographic or other ink containing grease, place the plate in the battery for a thick coating of iron, which will be deposited upon

the naked parts of the plate. Now wash off the ink with benzine and the subject of the drawing is represented upon the silvered plate, and the whites by the iron coating. It is then ready for electrotyping.

Another method for a relief block is by taking the plate with the transfer in ink upon it and silvering it as before. Then remove the ink by benzine, and the naked copper of the plate represents the subject, which is now to be heated in order to its oxidisation. Then take the silver roller supplied with copper amalgam and pass it over the plate. The amalgam is deposited upon the silvered parts of the plate and leaves the drawing depressed and the whites raised. In this condition it will serve as a mould for the electrotyper, and a block in relief will be the result.



T Y P O G R A P H I C E T C H I N G ,

By Messrs. A. & W. DAWSON.

SOME little surprise has been expressed at the inventors of this unique process adopting the title "etching," under the generally received, although fallacious, opinion that this term necessarily means, or at least includes, the chemical operation of biting by acid. Even in the most reliable dictionaries there is considerable confusion as to the precise meaning of the term. *To etch* is described as "to engrave upon metal—to draw;" while *etching* is explained to mean "engraving upon copper by means of aquafortis." The inventors of the process under consideration have very properly used the term "etching," not in its

popular, but in its correct signification of drawing with a point, because the means employed by them in the production of relief blocks do not include the application of acid.

The plate upon which the drawing is to be made is of brass, coated with a thin film of white wax. The nature of the composition of this wax is a speciality which is preserved by the inventors with secrecy. Its distinguishing characteristic may, however, be described as possessing a firm adhesion to the plate without the slightest tendency to crack or peel during the process of etching.

The outline of the subject to be drawn may, if desired, be sketched upon paper and transferred to the waxen surface of the plate, or the artist may at once etch his design direct upon the plate. This operation is performed by means of an etching point or needle, with which the artist makes his drawing by cutting through the wax, leaving the plate exposed in the lines drawn. The inventors have found that a special form of etching point was required, and the instrument adopted by them has been also approved by those who practice the older form of etching in connection with the application of acid.

As the lines are drawn by the point the wax is thrown up from the furrows into little shavings upon the surface of the plate; this superfluous wax must be removed, as the work progresses, by passing a soft brush over the plate.

The drawing or etching being finished, the parts intended eventually to be printed are shown by the exposed parts of the plate, while the wax still remaining upon the plate represents the whites of the picture.

If the plate so prepared were now to be handed to the electrotyper, a relief block might certainly be produced, but the "relief" would necessarily be so shallow as to present insuperable obstacles to the skill of the printer. To obviate this difficulty the plate is therefore submitted to a further operation, in which, indeed, the more especial value of the process consists. This second manipulation to which the plate is subjected has for its object the giving the necessary relative depth to the lines of the drawing by "building-up" wax upon the whites of the picture. This is a delicate operation, because, if not accomplished with care, there is a danger of the added wax filling up the lines of the drawing. The inventors, however, have in this part of their work very ingeniously taken advantage of the power of attraction of heat, or more properly speaking in this instance, the repellant power of the opposite extreme of cold. The wax is applied in a molten condition by means of a tool or pen which has been specially designed by the inventors with a view to this part of the operations. The difficulty to be guarded against is the tendency of the wax to deposit itself too rapidly or unevenly on the plate. The wax being kept in a fluid condition flows readily on to the prepared surface of the plate; directly, however, it reaches the exposed parts of the plate the wax seems to recede from the colder surface, and by this means the lines, even if alone and unprotected, are preserved from being partially filled up or altogether obliterated. In other words, the wax film already upon the plate possesses greater attraction for the warm wax which is being added, than does the exposed and therefore colder parts of the metal plate.

The building-up being completed, the plate is handed to the electrotyper, who brushes it over with black lead, and is able to produce an electrotype relief block by the ordinary means.

TYPOGRAPHIC ETCHED MAPS.—Probably the most useful, if not the most ornamental, of the products of Typographic Etching are the relief maps which are prepared by the same firm. These have certain peculiarities which distinguish them from the results of other processes, and notably from those produced by Zincography. The map is drawn—or more properly etched—upon the prepared plate, in the same manner as is above described. It may have been noticed that the lettering in these maps is remarkable for typographic excellence; and as it is one of the specialities of Messrs. Dawson it may very properly be here mentioned. When the lines of the map are etched the plate is placed upon a metal stand which covers a small tank of heated water. This slightly melts the wax, rendering it soft without bringing it to the fluid condition. By an ingenious contrivance which is held in the hand as a receptacle for type, the words, in ordinary type, are pressed on to the wax in the places required; while a hand-rest effectually protects the surface of the plate from injury, at the same time that it serves as a guide to keep the letters composing the word in a straight line. So efficient, as well as simple, is this plan of lettering, which is also applicable to diagrams of every description, that the inventors have been encouraged to have types of an exceptionally small, although still legible, character cut and cast for their exclusive use. The lettering being finished the plate is now ready for building-up and electrotyping.





ROCHESTER CASTLE.—TYPO-ETCHING *by* ALFRED DAWSON.



TYPO-ETCHING MAP.—TYPOGRAPHIC-ETCHING COMPANY.



ROCHESTER CASTLE.—TYPO-ETCHING *by* ALFRED DAWSON.



TYPO-ETCHING MAP.—TYPOGRAPHIC-ETCHING COMPANY.



ROCHESTER CASTLE.—TYPO-ETCHING BY ALFRED DAWSON.



TYPO-ETCHING MAP.—TYPOGRAPHIC-ETCHING COMPANY.

The peculiar advantages which the Typographic Etching Process possesses over the chemical processes employed for a like purpose, is that whereas in the latter the action of the acid in the biting tends to render the edges of the lines ragged, in the drawings by the former the lines remain as sharp and well-defined as they come from the artist's hand.

There are, however, other considerations which enter into the proper estimate of the comparative value of relief blocks, such as the time employed in production and the equally important item of cost. In both these respects the Typographic Etching Process can hold its own, particularly if the artistic results be taken into the calculation.

DAWSON'S POSITIVE ETCHING.

A NEW method has quite recently been perfected by Messrs. Dawson for producing the ordinary etching in intaglio, in which the employment of acid is altogether dispensed with. The plates so produced present all the characteristics of etchings made in the ordinary way, and are also printed at the copper-plate press. The means adopted are as simple as they are effective.

The material upon which the etching is made is a novelty, and believed to be at present a trade secret. Suffice it to say that it is a black substance susceptible of a high polish. Upon this plate the ordinary white ground or etching is applied evenly but not too thickly, and when dry, is ready for the hands of the artist. The substance of the wax should be as thin as possible, consistent with the production of a white and opaque

appearance. No special treatment is requisite by the artist, who proceeds with his picture precisely as in the ordinary form of etching.

The advantages of Dawson's Positive Etching consist first in the artist being able distinctly to see the effect of every line as it is drawn, because every mark made by the etching-point shews black upon a white ground; and secondly, the highly offensive operation of biting being discarded, the artist can pursue his labour with as much comfort as if he were drawing upon paper with a blacklead pencil. Another collateral advantage is the ease with which alterations may be made in the picture at almost any period of its progress, either by the insertion or erasure of work.

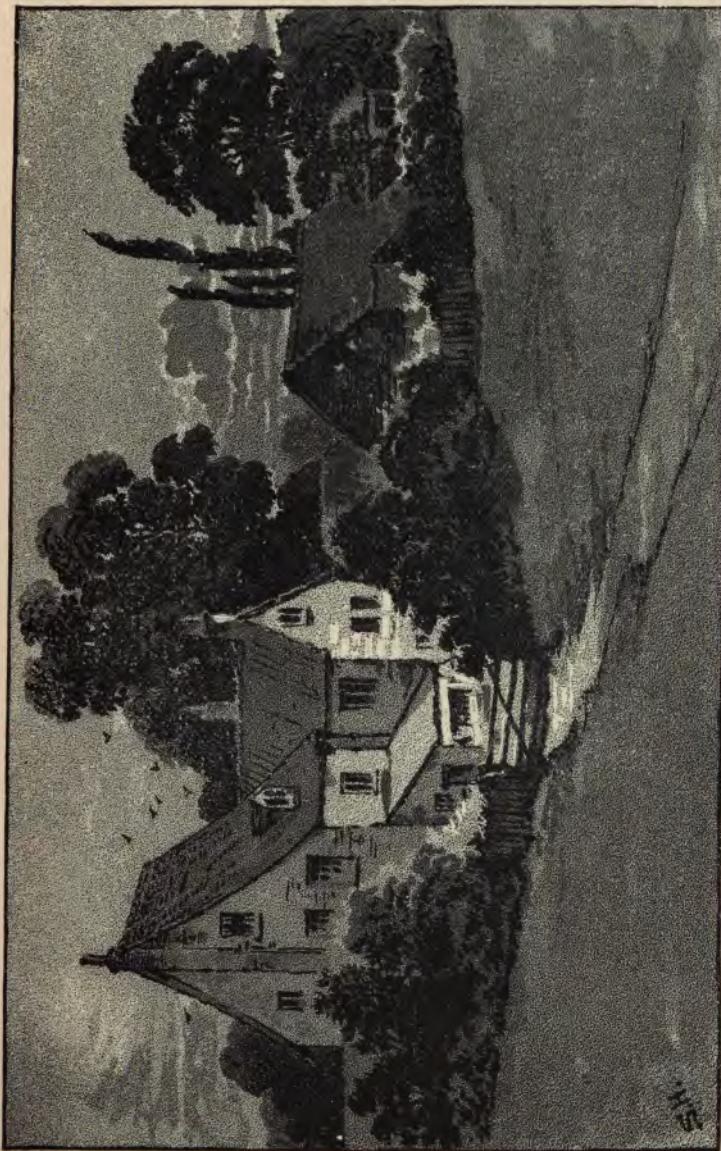
The drawing being completed a mould is made from it, which is then placed in the battery for the purpose of being electrotyped. For all intaglio plates for printing at the copper-plate press a greater deposit of copper is necessary than for relief-blocks, and consequently a much longer time must be given in the battery for the copper to "grow" upon the mould.



AQUATINT-ENGRAVING,

AS APPLIED TO RAISED BLOCKS FOR SURFACE PRINTING.

THIS is simply a reversal of the method of the ordinary aquatint engraving, described in a previous chapter as a branch of copper-plate engraving. Where copper-plate effects are desired, the lines drawn with the etching point or graver are bitten in; for the purposes of surface printing, on the contrary, the lines of the



RELIEF AQUATINT BLOCK.—*Designed and aquatinted by SHIRLEY HODSON.*



picture are *protected* from being bitten by being covered with a resin or other acid-resister. As a matter of history it may be stated that the first to suggest and adopt this reversed method of aquatinting was Mr. William Dickes, a London chromo-printer of reputation.

In chromo-printing from blocks in relief it becomes desirable to apply certain colours, particularly grey and flesh tints, with aquatints, in order to give a stippled appearance or "texture," and to avoid the shadows being put in by lines more or less hard, to which the artist must necessarily be confined if the picture be wholly done by wood engravings. Another important advantage is that greater variety of tone is obtainable at one printing from an aquatint plate than a single wood-cut can possibly be made to yield.

The general principles involved in the production of aquatint plates are all that can here be given, so much depending upon individual skill. The novice who may have the courage to attempt aquatint engraving in its application to the production of relief blocks will meet with difficulties at every step. Experience and practice can alone furnish the precise data upon which successful work can be accomplished, and even the expert occasionally finds his patience severely taxed. The comparatively few who practice it observe a considerable amount of secrecy as to the method and material used in "laying the grain," and indeed success is only to be acquired, as before mentioned, by experience.

Aquatints are made upon plates of copper, and the process of "laying the grain" consists in covering the surface of the plate with a resin, or other matter that will effectually resist the action of acid. This is

best accomplished by dissolving the resin or other acid-resister in a volatile spirit and flooding the mixture over the surface of the plate. In a few seconds the spirit is evaporated, leaving fine particles of resin equally distributed over the plate. The plate being so far prepared, a copy of the key-block is to be transferred to its surface, by laying the copy upon the plate and passing it through a lithographic press, but adopting the precaution of not using too much pressure, or the grain upon the plate may be injured. In ascertaining the proper condition of the grain a magnifying glass will be found necessary. The artist having now before him the prepared plate with the outline of his picture transferred to its surface, proceeds to paint over, with Brunswick black, all the parts of the drawing that are to be left solid, and then to subject the plate to a first "biting" with nitric acid. When this has been accomplished, and the plate again dry, the artist proceeds to paint out his next lighter shade, and the plate then undergoes a second biting. In like manner he paints out his third degree of still lighter shadow. In this condition of the plate nothing remains exposed to the action of the acid save the very lightest parts of the picture and the "whites." This last biting is more prolonged than the others, as there is more of the metal to be removed. The picture being thus completed the surface of the plate is cleaned, the whites are altogether removed with a graver or chisel, and the plate is ready for the electrotyper. Upon examination it will be observed that parts of the picture are solid, and that other parts will show two distinct degrees of shading with a granulated or stippled appearance. It may be mentioned that the taking out

the large whites with a graver is not absolutely necessary, as this can be done by the electrotyper in the wax mould.

Aquatints well made add very considerably to the effect of chromo-printing, and tend to give a close resemblance to water-colour drawings as the result of their judicious application.

Hitherto, aquatint relief blocks have been almost wholly confined to chromo-printing, but the process seems to indicate that the method is equally applicable to monochrome pictures. It may be confidently asserted that the aquatint has a speciality of its own, which only requires to be artistically developed to produce excellent results.



SHANKS' PATENT ENGRAVING.

THIS patent is dated April 30, 1874, and in the specification is described as a "means of producing raised surfaces or blocks for use in ordinary letter-press printing, or for colour printing of paper hangings, cotton, or other textile fabrics, and for the preparation of materials and construction of apparatus employed in producing such surfaces or blocks."

In nearly all the mechanical or chemical processes of engraving above described, the effort is closely to imitate the work of the engraver by leaving the subject of the drawing intact, and by removing what are technically called the "whites." In Shanks' patent, on the contrary, the operator does not directly

produce the engraved block, but makes the matrix or mould. The operation is so far reversed that the operator cuts the subject of his drawing deep into the mould, leaving the whites untouched. In the former methods, the block is prepared from which a matrix has to be made if duplicate plates are required.

The first portion of the operation consists in preparing a slab or basis of the mould, which is done by pouring into an iron frame "Dehydrated plaster of Paris mixed with water," and which is then allowed to set. The slab thus produced is then further dried by being submitted to heat, and in order still further to toughen the surface, is placed in a bath of shellac dissolved in alcohol, after which it is again dried, and becomes fit for use. By the means thus briefly described the plaster slab is very considerably toughened, and is capable of receiving incisions upon its surface with a sharp and clean cut. These incisions are made by a fine conical-shaped drill or cutter, which is kept rapidly revolving by steam or other power.

The special machine which forms the subject of Mr. Shanks' patent is an ingenious adaptation of the principle of the ordinary pentagraph. One end or arm of the pentagraph is furnished with a joint, with which the operator traces the drawing; but the other end or arm—instead of terminating in a pencil, as in the customary form of the instrument—is attached to the bed upon which the plaster slab is fixed, and which is provided with the means of moving about in correspondence with the movement of the point or pencil directed by the operator. The drawing to be engraved is placed upon the operator's table and the

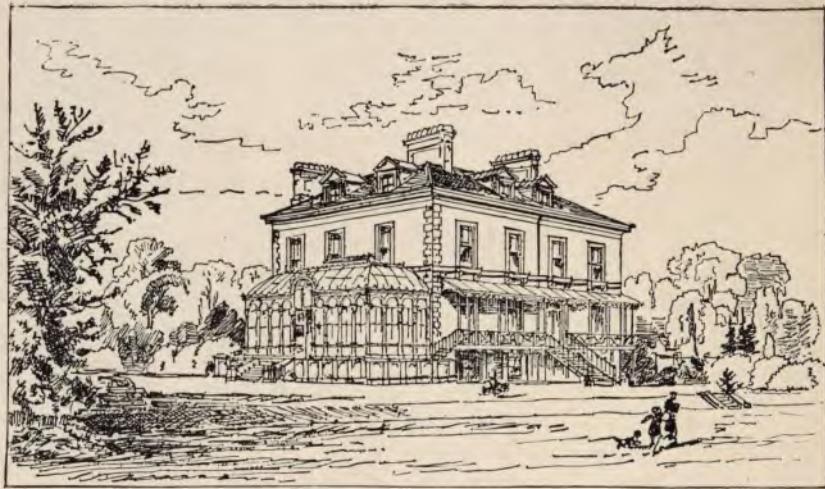
plaster slab, affixed to the further end of the pentagraph, is brought under the drill or cutter, which is stationary except in so far as it has a revolving motion given to it by some power, as previously explained. Now as the operator moves the point of the pentagraph in tracing the drawing, the portion of framework at the further end of the pentagraph is moved so as to bring a corresponding portion of the slab under the influence of the drill or cutter. By this means an exact copy of the drawing is reproduced on the slab, but all the lines are *cut* into the slab instead of being merely traced thereon. The drawing being finished, the slab is removed and is treated as a matrix, into which molten stereotype metal is poured, which thus becomes the block from which to print; or the matrix may be passed into the battery as for an electrotype.

The machine at present has been confined to the production of meteorological and other outline maps, and to such architectural or artistic subjects as can be given in *mere outline*. The capabilities of the invention do not appear to have been fully tested, as no attempt has yet been made with work of a higher artistic character, and it may therefore be considered premature to offer an opinion as to whether such descriptions of work are within the scope of its achievement. This much, however, may be stated, that it has proved itself admirably adapted for the work upon which it has hitherto been employed, viz.: the production of outline blocks capable of being printed with letter-press at the speed required for the purposes of the daily papers. Unfailing certainty of result, together with speed in production, seem to be the peculiarities of the invention.

GRAPHOTYPE.

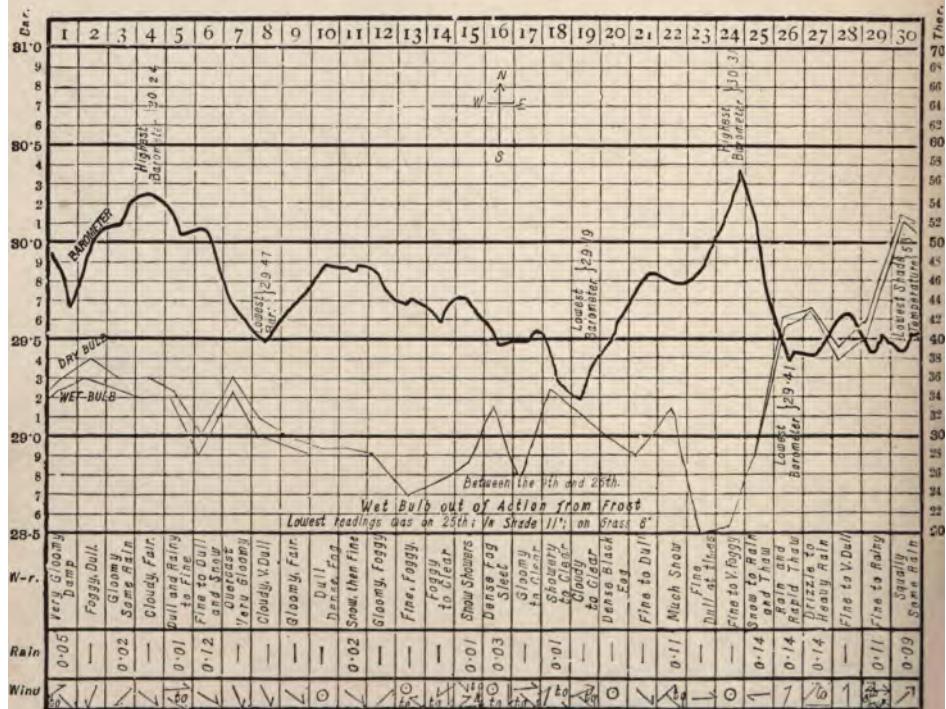
THIS process is of American origin, and was discovered by Mr. De Witt Hitchcock, an artist and wood-engraver of New York. The following are the necessary instructions :—

Upon a sheet of perfectly flat metal distribute an even layer of very finely pulverized chalk. Upon this place a plate of steel, such as is generally used by engravers, and submit the whole to considerable pressure in an hydraulic press. The chalk will be found to be a solid compact mass, with a very highly enamelled or smooth face. Over this a strong coating of a "peculiar size" has to be given. The particular size is not specified by the discoverer, but the object is simply to give increased solidity to the chalk. When dried the plate is ready for the artist. The material employed for drawing upon the plate is a chemical ink composed of "lamp-black, gluten, and a chemical which gives the fluid the advantage of never drying until it comes in contact with the chalk plate." The plate is then submitted to the action of brushes, applied either by hand or by mechanical rotary means, for the purpose of removing all the chalk from the plate, except such portions as have received the artist's touches, and the protection of the drawing material which he has used. The plate has now to be "saturated with a solution which renders all as hard as marble," and the plate is ready for the electrotyper, who will treat it as he would a block engraved in the ordinary way from which he desires to take an electrotype.



SHANKS' PATENT PROCESS.

For Description, see Part II., Engraving by Mechanical Processes.

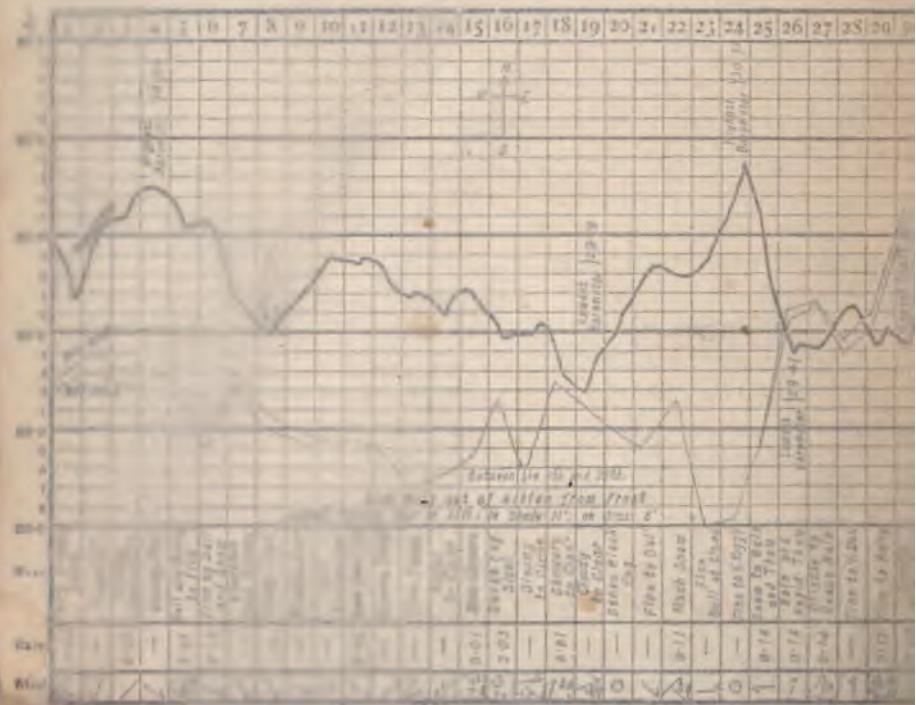






SHANKS' PATENT PROCESS

For Description, see Part II., Engraving by Mechanical Processes.



This invention was for some time worked by a company, which provided plates already prepared for the artist, and the necessary material for him to use. The drawing was directed to be made with brushes similar to those used by lithographic artists.

For some time this process has fallen into disuse, having been superseded by other methods of a more reliable character as to the results obtained.





CHAPTER II.

Photographic Processes.

INTRODUCTION.



ROM the first discovery of the natural laws which lie at the foundation of the science of photography, its applicability to the purposes of engraving was distinctly recognized and appreciated. Indeed, it is not too much to aver, that photography was called into existence mainly as an aid, if not as a rival, to engraving.

In proof of this statement, it may be pointed out that in the early correspondence between Niepce and Daguerre (who are justly entitled to rank as joint-inventors or joint-discoverers), the former speaks of "having perfected in an important degree his process of *engraving upon metal*," by which description he alludes to the art of photography.

This statement of the inventor is alone sufficient, it is submitted, to justify, if not to demand in this place some account of the circumstances attending the

discovery of the science of photography. This is all the more desirable, because, in the opinion of those best entitled to pronounce judgment in the matter, photography may be said to be still in its infancy. The reproduction of an image in the colours of nature, is confessedly an idea for realization in the future; and although some glimmerings of this desideratum have been observed, they have served at present only to stimulate experiment.

JOSEPH-NICÉPHORE NIEPCE was born March 7, 1765, at Châlons-sur-Saône, and after studying for the church, was, during the disturbances of the Great Revolution, compelled to enter the army, from which, however, he had to retire in 1794, in consequence of ill-health. He then settled at Saint Roch, near Nice, where his taste for mechanical invention, which had shewn itself in his early youth, found opportunity for development. In the course of the researches to which he devoted himself, he acquired the elements of the then new art of lithography, and after having mastered the theory of this art, he next turned his attention to the capabilities of the camera as a means of picture production, and was thus led to devote his energies to the solving of the difficult problem of fixing the object produced in the camera.

While Niepce was pursuing his experiments single-handed, another worker in the same field, with whose name the world is even more familiar, was carrying on similar researches. LOUIS-JACQUES-MANDÉ DAGUERRE was born at Cormeilles, near Paris, in 1789,—just twenty-four years after the birth of his co-inventor Niepce. He commenced his career as a scenic artist, and in this capacity the young Daguerre

soon made himself a reputation, completely eclipsing that of his master, Degoty. All Paris, it is said, witnessed the successful efforts of his genius, particularly in the novel effects given to the scenes in the Ambigu Comique, by the employment of a strong illuminating power. Daguerre's next step was the production of dioramic pictures, where, by means of directing the light either upon or behind the canvas, sudden transitions were made from one picture to another. This was effected by painting on both sides of the canvas. In this way a peaceful rural scene (the light directed upon the canvas) was instantaneously transformed (by being lighted from behind) into a representation of the ruin and desolation caused by the eruption of a volcano. With such effects we have now become familiar, although at that time they were highly attractive novelties. In the execution of these dioramic pictures Daguerre had recourse to the dark chamber or camera-obscura, and it was while thus operating that the desire was formed in his mind to "fix the image produced by nature, and to engrave it for ever." He was acquainted, there is every reason to believe, with the imperfect results of the experiments of Professor Charles, who successfully caught the shadow projected by the agency of light upon a sensitized paper, but who altogether failed to retain the image when produced. It was at this period of his career that Daguerre paid frequent visits to the *Quai de L'Horloge*, to converse with Charles Chevalier, the optician; and here it was that Daguerre first heard that investigations and experiments similar to his own were also being made by Niepce. At Chevalier's instigation, Daguerre, in 1826, first wrote to his rival,

or, more properly speaking, co-inventor; but extreme caution prevented these first overtures of friendship being reciprocated.

In 1827, just one year after the first attempt at intimacy, a second letter passed between the two inventors, in which Daguerre speaks definitely of his experiments in fixing the image of the camera, and suggests that an interchange of thought and experience should take place between himself and Niepce. Finding that his correspondent was not to be repulsed, Niepce made some enquiries of Lemaitre, the engraver, which proving satisfactory, he determined to meet Daguerre's friendly overtures in a similar spirit, as is proved by his letter to Lemaitre, bearing date April 3, 1827.

"I forgot to tell you in my last letter that M. Daguerre has written to me, and sent me a little picture very elegantly framed, done *à la sepia*, and finished by his process. This drawing, which represents an interior, is very effective, but it is difficult to determine exactly what is the result of the process, as the pencil has intervened. Perhaps you, Sir, are already acquainted with this kind of drawing, which the inventor calls "smoked pictures," and which are for sale. Whatever may have been Mons. Daguerre's motive, as one good turn deserves another, I have sent him a metal plate slightly etched by my process, choosing as the subject one of the engravings which you sent me. This cannot in any way compromise my secret."

The cautious reserve with which, upon the part of Niepce, the correspondence was thus commenced, seems gradually to have broken down, for in a subsequent letter to Daguerre, he says, "I shall be desirous

of knowing the result of your labours, and I shall be flattered to offer you such of my researches of a similar nature as I am occupied with."

In the autumn of the year 1827, Claude Niepce, the brother of the inventor, was attacked with illness of so dangerous a character as to compel our inventor to undertake the journey to England, and being unexpectedly detained at Paris on his way, he availed himself of the opportunity thus afforded of an interview with Daguerre. The result of this personal intercourse was an arrangement for entering into partnership, so that each might conduct his experiments in conjunction with, and upon the advice of, the other. This partnership seems to have given zest and encouragement to the researches of the inventors; and their joint labours were from this time only interrupted by the decease of Niepce, which took place on the 5th July, 1833, just after Daguerre had added to the common stock of information by discovering the value of iodide of silver as a sensitizing medium.

Daguerre now continued his labours alone, but in 1837 he generously admitted Isidore Niepce, the son of his late partner, to a participation in his important discoveries, and an endeavour was then made, but without success, to form a company to work the new invention. Capitalists looked upon the matter as too chimerical a venture upon which to risk their money.

To offer the invention to the Government of their country was the next step decided upon, and in the prosecution of this plan Daguerre sought an interview with the illustrious astronomer, M. Arago, who introduced him to M. Duchâtel, the Home Minister, and by whom the project was at once favorably received.

This proceeding resulted in the very modest pension of 6,000 frs. to Daguerre and 4,000 frs. to Niepce, with a reversion of one-half to their respective widows. This arrangement having been duly ratified by the Senate, M. Arago was required, in his position as Secretary, to communicate a description of the Daguerreotype process to the Academy of Sciences, which was accordingly done on the 10th August, 1839.

It was not, however, until after the discoveries of Claudet and Fizeau had been made, that the Daguerreotype picture was entitled to be considered a proven success. Claudet's contribution to this end was the discovery of the means for accelerating the process of taking the image, while Fizeau's labours resulted in acquiring the method of fixing the picture.

While these events were transpiring in France, Mr. Henry Fox Talbot was pursuing researches in England, also having for their object the fixation of the picture,—in this instance, however, upon paper. Mr. Talbot's labours had led him, in 1834, to produce a photograph upon paper sensitized by being immersed in a solution of iodide of silver. The picture was produced by the action of light through the agency of the camera, and was then developed with gallic acid.

Claudet, a French artist, having purchased the right to introduce the Daguerreotype processes into England, contributed, as has been mentioned, an "accelerator," by which the action of the taking of the picture was rendered more rapid. This he effected by stimulating the action of iodine of silver by adding chloride of iodine. Previous to the introduction of the "accelerator," still life was the only department that was open to the new art; but Claudet's discovery

enlarged the field of operations by including animate objects, and was thus the first step towards the possibility of instantaneous photographic portraiture.

The means of obtaining the picture being discovered, and the process of development accelerated, it still remained to perfect some means for fixing the subject, and thus rendering it indelible. As the light, acting upon the sensitized plate or paper, printed the objects in the camera or upon the negative, so the full exposure to light after the picture was taken would tend to obliterate it, unless the sensitized condition of the paper or plate could be counteracted or destroyed after the picture were taken. It remained for M. Fizeau to complete the circle of photographic knowledge, by discovering a method of fixing the picture, which he accomplished by pouring chloride of gold and hyposulphite of soda, in solution, on to the plate, and then submitting the plate to the action of moderate heat.

Talbot, it has been said, was pursuing his experiments in England with the stimulus offered by success, at the time when Daguerre's invention was being promulgated in France. Impressed with the importance of the results said to be attained, he made a communication to the Academy of Sciences, but without being so fortunate as to gain the attention which he had anticipated and which his successful experiments undoubtedly deserved.

The first principles of photography having been established by the experiments and patient labours of Niepce, of Daguerre, and of Talbot, other workers in the world of science contributed to develop, improve, and perfect the art; and among such, may

be mentioned Claudet, Fizeau, Chevalier, Blanquart-Evrard, Sir John Herschel, Niepce de Saint-Victor, Legray, and Scott Archer.

The most important of the modern discoveries in connection with the subject is very properly called "instantaneous photography," which is accomplished by rendering the material upon which the image is taken so highly sensitive as to receive a perfect impression of an object while illuminated merely by a spark of electricity.

It has been already stated, that a substitute for engraving was the object desired when the first glimpses of photography were discovered, as is very clearly stated by Isidore Niepce, who thus writes:—
"In 1813, my father made some attempts at engraving and reproducing drawings by lithography, which had then been recently introduced into France, and which attracted his admiration. Some broken stones, intended for repairing the road, and which came from the quarries of Chagny, seemed to him to be suited, from the fineness of their grain, to be usefully employed in lithography. We chose some of the largest of these stones, and my father had them polished by a marble worker of Châlons. I then made various drawings on them, which my father coated with a varnish he had prepared; he then etched them by means of an acid. My father afterwards replaced these stones by polished tin plates, which he coated with various varnishes, then placed on them the drawings which he had previously varnished to render them transparent, and exposed the whole to the action of light."

This was anterior to the commencement of the inventor's experiments with the camera, which ultimately led him to the discovery of photography.

Although the notice above given is necessarily brief, it is hoped that what is thus related of the persons and incidents connected with the discovery of photography, will prove sufficient to create some degree of interest in the subject, and lead to an appreciation of the following descriptions of the various methods adopted for utilizing this important discovery. The number of these methods seems almost daily increasing; but it will be found that there are certain principles upon which they are all based, and that the differences, in several cases, result from some apparently slight variation in manipulation, due to the superior skill or experience of the operator. The methods which have been selected are those which more directly apply to be subject to which this work is devoted; and as far possible, only those processes have been chosen which appear to present some distinctive features.

It is worthy of remark, as a deduction from the history of the subject, that the researches of the inventors were conducted to the knowledge of photography through the medium of the earlier art of lithography; and that, in both, the object sought was the simplification or development of engraving. Some enthusiasts there are, who, from an exaggerated belief in some one or more of these processes, entertain the opinion that engraving either upon metal or wood will ultimately be annihilated; but the calmer judgment of those experts whose minds are open to appreciate results on their own merits, must lead to the conclusion



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that each distinctive method, whether of engraving or of process, has its own specialty, for which it will continue to be cultivated, and which places it out of the region of comparison.

PHOTO-LITHOGRAPHY.

The most useful of the direct applications of photography is based upon a knowledge of the chemical change induced by the action of the rays of light upon bichromate of potash mixed with albumen. The practical manipulation is as follows—A lithographic stone having been prepared of good quality, and its surface is spread with a thin coating of albumen and bichromate of potash. Upon this there is then placed a glass photographic negative, which is exposed to the action of light. The character of the sensitive bichromate is so changed by the light, so as to make the transparent portions of the negative less sensitive; a roller passed over the stone will therefore roll away all those parts of its surface that have been subjected to the light. In this way will the stone receive the impressions as in the ordinary process of engraving.

The following extract from an article in the Photographic Circular gives an account of the process and complements. The reader may also consult Poitevin's work, published in Paris, 1854, entitled "*Photographic Engraving without Acid or Silver.*"

M. POITEVIN'S PROCESS.—"If an ordinary lithographic stone be covered with an albuminous varnish mixed with bichromate of potash, and if this varnish be



Reading a book by candle-light. - 12. Woodcut. -

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THIS most useful of the direct applications of photography is based upon a knowledge of the chemical change induced by the action of the rays of light upon bichromate of potash mixed with albumen. The practical manipulation is as follows:—A lithographic stone having been procured of good quality, over its surface is spread a thin coating of albumen and bichromate of potash. Upon the stone is then placed a glass photographic negative, which is exposed to the action of light. The character of the gelatinous bichromate is so changed by the light passing through the transparent portions of the negative, that an inking roller passed over the stone will transmit ink only to those parts of its surface that have been acted upon by the light. In this condition the stone will yield impressions as in the ordinary method of lithography.

The following extract from the Report of the Photographic Commission upon this subject is clear and complete. The reader may also with advantage consult Poitevin's work, published in Paris in 1862, entitled "*Photographic Impression without Nitrate of Silver.*"

M. POITEVIN'S PROCESS.—"If an ordinary lithographic stone be covered with an albuminous solution mixed with bichromate of potash, and if this liquid be

allowed to dry spontaneously, the albumen, however much it may be altered in its nature, is not in its solubility, and a simple washing in warm water is sufficient to remove from the stone the greater part of the unaltered matter which has been unable to penetrate it. If the surface thus prepared be exposed to the action of light through the unequally transparent parts of a negative, a change takes place, which is certainly not an ordinary coagulation, and to which the oxidation of the chromic acid doubtless contributes, by rendering the albumen insoluble, and causing it to remain on the stone in large quantities, the larger the more intense the exposure to the light has been. Thus changed, the albumen resists water as if it were a greasy or fatty substance. In this state it readily absorbs an ordinary greasy ink, which does not adhere to the portions of the stone where the light has not acted; so that if a roller charged with an ink containing soap, which lithographers call transfer or reprinting ink, is passed over the stone, the ink adheres only to the albumenised parts of the surface, and the latter is thus coated with a greasy ink distributed in varying proportions of an ordinary drawing. The excess of ink is removed by acidulation and damping with a sponge. The drawing is made level by being submitted to the ordinary lithographic operations, that is to say, the removing of the colour with essence of volatile oil and the re-inking with the roller; and nothing further remains but to cover the stone thus prepared with a coating of gum, which only adheres where there is no ink, and to submit it to ordinary inking and to acidulation, to be enabled to obtain from it as many copies as if the drawing, which has been entirely made by the

light, had been made in the ordinary lithographic manner. Such is M. Poitevin's method."

This discovery by Poitevin yielded yet another result. It was noticed that the gelatinous coating of bichromate of potash when acted upon by light lost the power of swelling; and that the film, upon being washed with water, became slightly raised in those parts which the negative had protected from the light, while the other parts did not undergo any such change. The stone thus presented irregularities in its surface corresponding with the lights and shadows of the photograph, and in this condition was prepared for the manipulations of the electrotyper, who was thus enabled to produce an electrotype plate suitable for printing at the type-press.

M. Poitevin's first method, which he practised in 1842, was as follows:—

A Daguerrotype having been taken upon a plate, and the picture developed in the mercury vapour box, and while the unchanged iodide of silver still remains upon the "blacks" of the image, the plate is connected with the negative pole of an electric battery and placed in the electrotype bath. A layer of copper is thus deposited upon the parts of the plate which are unprotected by the coating of iodide of silver. The iodide of silver is next removed by the application of a solution of hyposulphite of soda. The copper is now oxidized by heat and quicksilver applied over the surface of the plate, which having affinity for the silver, leaves the oxide of copper untouched. The plate is next treated with gold leaf, and a like result is produced, the gold being attracted to the amalgamated parts, leaving the oxide of copper in its former condition. Nitric acid, or aquafortis, being now applied,

the parts unprotected by the gilding are bitten away, leaving the subject of the picture in relief, and a "surface block," as it is technically termed, capable of being printed at a type-press, is the result.



PROCESS OF M. BALDUS.

THE process of photographic engraving by M. Baldus—dating about 1854—is thus described by M. Louis Figuier (*Les Merveilles de la Science*):—

"A coating of bitumen of Judæa is spread on a copper plate. On the plate thus prepared with the impressionable resin, is placed a photographic proof on transparent paper of the object to be engraved. This proof is a positive, and must in consequence produce, by the action of the light, a negative on the metal. About a quarter of an hour's exposure suffices to imprint the object on the resin, though it is not visible. It is developed by washing the plate with a solvent which clears away the parts unaffected by the light, and leaves a negative picture formed by the parts of the bitumen rendered soluble by the solar rays. This picture is formed of a film so delicate and fine that it soon begins partly to disappear from the effects of immersion in the liquid. To give it the necessary solidity and resisting power, it is left for two days to the action of a diffused light. After the picture has been thus consolidated, the metal plate is plunged into an electrotyping bath of sulphate of copper; and now comes the most wonderful part of the process. Attach the plate to the negative pole of the battery, and on all the parts of the metal unprotected by the bitumen a

coating of copper in relief will be deposited ; attach it to the positive pole, and the parts which are unprotected will be attacked and hollowed, or, technically speaking, bitten out. Thus can be obtained at will, from the negative pole an engraved plate, which can be used for printing from like a wood engraving, and from the positive pole a plate as used in copper plate printing."

In 1855 MM. Garnier and Salmon introduced a process that has much to recommend it for its ingenuity, and has thus been described in *Traité général de Photographie, par Monckhoven* :—

"A brass plate is exposed, in the dark, to vapours of iodine, then submitted to the action of light behind a negative, and rubbed with a cotton polisher soaked in mercury, which only attacks the parts unaltered by the light. An inking roller being now passed over this plate the ink is repelled by the parts where the mercury has acted, and adheres to the free parts. The latter, therefore, form the shadows, and when treated with nitrate of silver give a plate capable of printing as in copper-plate printing. If the ink be not removed, and if after the first corrosion with the nitrate of silver a coat of galvanized iron be deposited on the plate, the iron adheres only to the parts where the mercury acted, and the ink being now removed leaves bare the iodised brass. Mercury is again applied to the plate, and does not adhere to the iron. Passed under the inking roller the ink only adheres to the iron. If a typographic plate is required, instead of iron, gold is used to form the deposit, and the parts unprotected by the latter are bitten with an acid to the required depth."

ALBERTYPE.

THIS process, so named after Mons. Albert, a photographer of Munich, has obtained considerable celebrity, and is based in great measure upon the theory of M. Poitevin.

Take a thick well-polished glass and cover it with a solution of gelatine and bichromate of ammonium and albumen; then expose this coating to the action of light, which will render the composition insoluble in water. Upon this apply another coating composed of gelatine, isinglass, bichromate of potash, and a mixture of resinous matters (benzoin, tolu) in alcohol. Now place the prepared plate with the negative to be reproduced, in an ordinary photographic printing frame and submit it to the necessary exposure to light. The image having been thus taken, plunge the plate in tepid water, which will dissolve the soluble parts of the film unaffected by the light, and the other parts will be consequently left in slight relief. Dry, and with an oiled flannel rub the plate, and it is ready for inking with a lithographic roller.

HELIOTYPE.

It is asserted that this process is identical with that last described,—in the one case the designation being derived from the natural agent employed, and in the other from the name of the discoverer. Heliotype certainly resembles the Albertype process in its results and in its procedure, the printing being done in both instances from the gelatine direct. In this particular

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THEATRIS

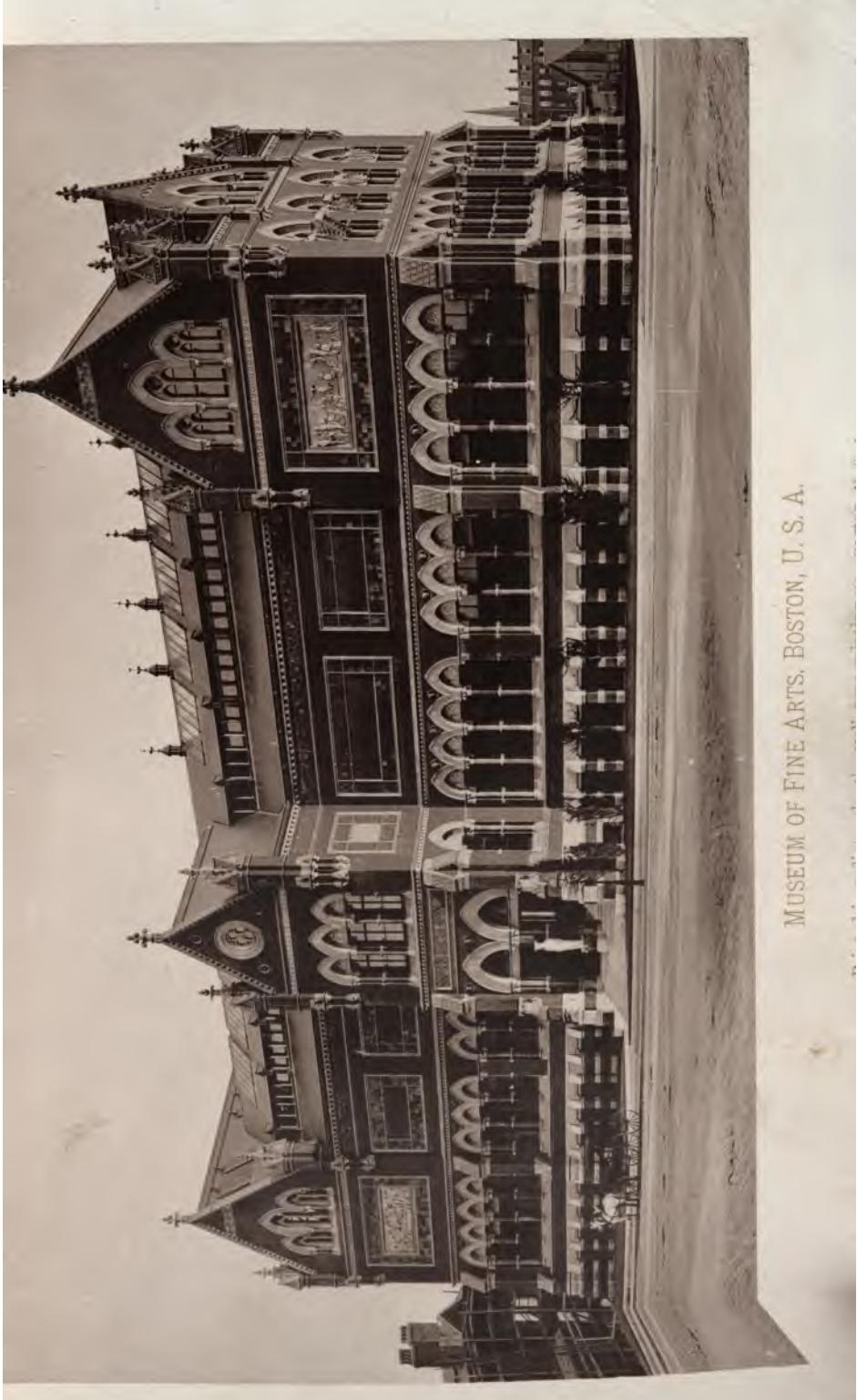
A. & W. T. TYPE.

is named after Mme. Albert, a photographe, who has given the best account of its contained merits possible to me, and I will, in some measure, repeat the theory of the process.

Take a sheet of lithographic glass and cover it with a solution of gum and bicarbonate of soda dissolved in water, then expose this coating to the action of light, which will sensitize the composition insoluble in water. Upon this apply another coating composed of ammonia, borax, two grains of potash, and a mixture of resins (mastic, elemi, benzoin, tolu) in alcohol. Now place the prepared plate with the negative to be reproduced in an ordinary photographic printing frame and submit it to the necessary exposure to light. The image having been thus taken, plunge the plate in tepid water, which will dissolve the soluble parts of the film unaffected by the light, and the other parts will be consequently left in slight relief. Dry, and with an oiled flannel rub the plate, and it is ready for inking with a lithographic roller.

H. E. L. I. O. T. Y. P. E.

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it differs from the Woodbury-type process where the gelatine is used to make the printing surface or mould. The sensitizing materials are alike in all.

Upon the surface of a plate of glass which has been previously waxed, a solution is poured while hot. This solution is made of gelatine dissolved in warm water, with the addition of bichromate of potash to render it sensitive, and chrome alum to make it hard and durable. When dry, this gelatine film is stripped off the waxed plate and placed in contact with a reversed negative and submitted to light. The film with its photographic image is now attached to a plate of metal and the superfluous chemicals washed out with water, leaving upon the plate so much of the gelatine as carries the drawing. In this condition it is capable of yielding impressions from the press in the ordinary method of lithographic printing, the plate being alternately damped with water and inked. The gelatine left upon the plate is hard, insoluble, and non-absorbent, therefore it repels the water and has an affinity for the greasy ink. The peculiarity of the Heliotype process is that the pictures are produced without the glaze which always accompanies silver prints, and which is also observable in Woodbury-type prints. In addition there is the advantage of the prints not requiring to be cut and mounted, thus rendering them very suitable for the purposes of book illustration. It must be borne in mind that by the application of chrome alum the portions of the gelatine which have received the photographic image have been so hardened that they are capable of resisting the wear involved in the friction occasioned by the inking process and by the pressure used to obtain impression.

There is another process of Heliotype which has been designated "The Improved Heliotype Process," by which photographs are rendered capable of being printed in permanent ink at an ordinary type-press. The following description has been communicated:—

Gelatine is dissolved in water, and to this solution is added bichromate of potash, which renders it susceptible to the action of light, and chrome alum, which hardens the gelatine so as to withstand the wear involved in printing. The solution is poured on to a perfectly level plate of ground glass, and when set, it is placed in a dark room of suitable temperature in order to dry. The gelatine object (technically called a skin) when dry, is torn off the glass and exposed to light under a negative in an ordinary photographic printing frame, until the subject of the picture is visible on the skin. The skin is then removed from the printing frame and placed face downwards upon a board which has been covered with black velvet, and in this position the skin is again exposed to the light until the picture appears to be almost obscured. It is then mounted upon a steel plate which has been previously coated with india-rubber, and is immersed in water until the bichromate of potash that has not been acted upon by the light is washed away. The skin may now be placed upon an ordinary type-press, and, after being inked, will yield impressions that are indelible. The ink employed is a mixture of lithographic ink reduced by the addition of a small quantity of lard or oil. A "frisket" or "mask" made of oiled paper cut to the size of the print, is used to protect the margin of the paper printed upon, while at the same time it assists the printer in picking up the sheet, after



STYDDEROW - CRAG.

Printed by the Plain-Mechanical Printing Company
Lansdowne Road, Tottenham.

The following section of Heliotype which has been reduced to "Heliotype Tintype," however, will be reduced capable of being printed in black and white ordinary apparatus. The following should be sufficient for communication.—

A portion of leather or wood and the reduced skin of a small animal, which contains a number of hairs, the skin of hair and leather soon, when burnt, becomes smooth so as to diminish the wear and tear of clothing. The leather is ground on a smooth hard plate of ground glass, and when set, exposed at a dark room of moderate temperature to heat for day. The porous object (industrially called a skin) which has been set off the glass and exposed to light, will appear as an ordinary photographical printing plate, and the subject of the picture is visible on the skin. The skin is thus removed from the printing frame and placed face downwards upon a board which has been covered with black varnish. In this position the skin is again exposed to the light, and the surface appears to be almost obscured. It is then placed upon a steel plate which has been previously coated with India-rubber, and it immediately impresses upon the India-rubber of possess that has been acted upon by the light is washed away. The skin may now be placed upon an ordinary apparatus, and when baked, will yield impressions that are durable. The ink employed is a mixture of lithographic ink reduced by the addition of a small quantity of water or oil. A "brush" or "rake" made of aged rags set to the size of the print, is used to impress the surface of the paper painted upon, while at the same time it makes the printer in pulling up the sheet, also



STYBORROW : CRAG.

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Printed by the Photo-Mechanical Printing Company,
Lansdowne Road, Tottenham.

These principles suffice to define the method used by the author in his "negative" photolithography. It consists in exposing the sensitized surface to strong light, so as to reduce the intensity of the exposure to such a point that the gelatin does not become completely hardened, but retains its plasticity, so that it can be easily washed off. This is done by immersing the plate in a bath of ground glass and water, suspended in which there is a solution of soluble potassium iodide to dry. The gelatin sheet (which contains copper) is then taken off the glass and exposed again under a negative in an ordinary photographic printing frame, and the subject of the picture is printed on the plate. The sheet is then removed from the printing frame and placed face downward upon a board which has been covered with black paper. In this position the sheet is again exposed, so that the picture appears to be almost obscured. It is then mounted upon a steel plate which has been previously coated with India-rubber, and is exposed to light until the bichromate of potash that has not been acted upon by the light is washed away. The steel tray can be placed upon an ordinary printing frame, and, after being baked, will yield impressions that are durable. The ink employed is a mixture of India-rubber ink reduced by the addition of a small quantity of turpentine or oil. A "mask" made of colored paper cut to the size of the print, is used to shield certain parts of the paper printed upon, while at the same time it assists the printer in picking up the sheet after



STYBORROW : CRAG.

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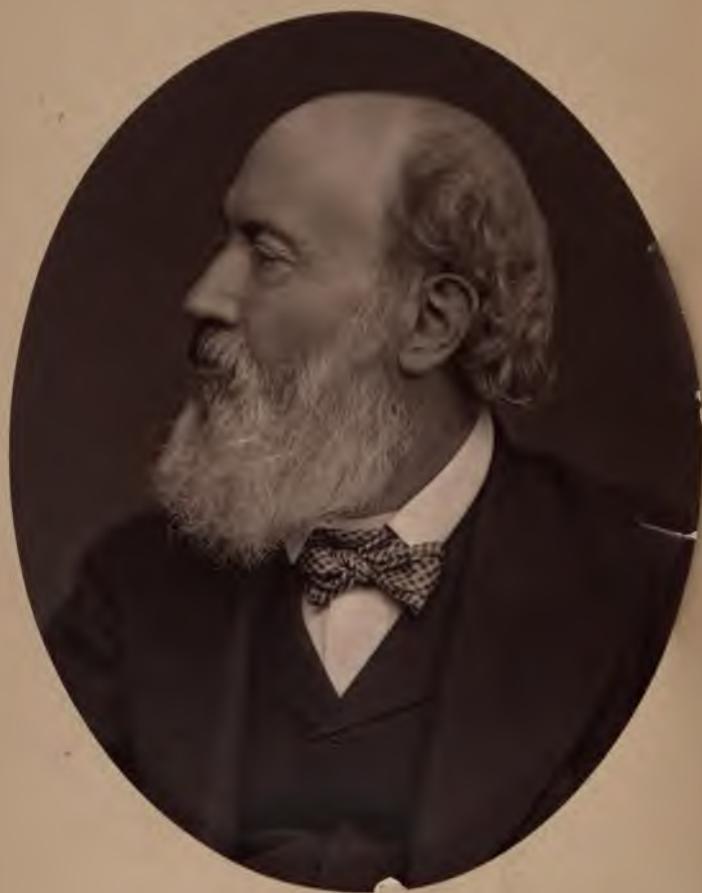
Printed by the Photo-Mechanical Printing Company,
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ART ILLUSTRATION.

There is another process of Heliotype which has been designated "The Improved Heliotype Process," by which photographs are rendered capable of being printed in permanent ink at an ordinary type-press. The following description has been communicated —

Gelatine is dissolved in water, and to this solution is added bichromate of potash, which renders it susceptible to the action of light, and chrome alum, which hardens the gelatine so as to withstand the wear involved in printing. The solution is poured on to a perfectly level plate of ground glass, and when set, it is placed in a dark room of suitable temperature in order to dry. The gelatine object (technically called a skin), when dry, is torn off the glass and exposed to light under a negative in an ordinary photographic printing frame, until the subject of the picture is visible on the skin. The skin is then removed from the printing frame and placed face downwards upon a board which has been covered with black velvet, and in this position the skin is again exposed to the light until the picture appears to be almost obscured. It is then mounted upon a steel plate which has been previously coated with india-rubber, and is immersed in water until the bichromate of potash that has not been acted upon by the light is washed away. The skin may now be placed upon an ordinary type-press, and after being inked, will yield impressions that are infusible. The ink employed is a mixture of lithographic ink reduced by the addition of a small quantity of fat or oil. A "fraket" or "mask" made of oiled paper cut to the size of the print, is used to protect the margin of the paper printed upon, while at the same time it assists the printer in picking up the sheet, after

"WOODBURYTYPE."



SIR JOHN GILBERT, R.A.

*SPECIMEN BY THE WOODBURY PERMANENT PHOTOGRAPHIC
PRINTING COMPANY.*

having been printed. Without this precaution the paper might adhere to the skin in the parts representing the "whites" of the picture. The printer usually lays an extra sheet of paper—generally enamelled paper—upon the back of the sheet upon which the impression is to be taken, before giving the pressure by means of the platen of the press. After each sheet, the skin requires to be slightly damped with a wet sponge and then inked before taking the next impression. A single skin is calculated to yield from 1,000 to 1,500 impressions without any perceptible deterioration. When a larger number of impressions may be required a fresh skin must be prepared.

The two varieties of Heliotype which are above described resemble each other in all the essentials ; and the *rationale* of the process consists in the portions of the skin unchanged by the light absorbing the water, while those portions through which the light has passed are rendered capable of taking the ink.

Albertype, Heliotype, and the varieties of Photogravure are all capable of being printed upon paper at either the copperplate or typographic press ; while the Woodbury-type and Stannotype processes are printed upon special presses, and the prints need to be cut up and mounted upon paper when used as book-illustrations.

PHOTOGLYPTIE, OR WOODBURY PERMANENT PROCESS.

THIS process, which has been named after Mr. Woodbury, its inventor, is based upon the action of light

upon a mixture of gelatine and bichromate of potash, and is extensively used for purposes of book illustration by M. Goupil, and also by the Woodbury-type Company of London.

A leaf of gelatine, containing some slight colouring matter, such as Indian ink, is rendered sensitive by a solution in water of bichromate of potash. The gelatine is then placed in contact with a photographic negative and exposed to light in an ordinary photographic printing frame. The portions of the bichromatised gelatine which have not been operated upon by the light retain their soluble condition, while the other portions are hardened. The gelatine leaf is now to be taken to the dark room, removed from the printing frame, and placed on a glass plate which has been previously covered with india-rubber varnish, and then immersed in a bath of tepid water. The water, which will require to be constantly renewed, gradually dissolves the still soluble portions of the gelatine (the whites of the picture), leaving the other portions unaffected. The gelatine film or leaf is now removed and dried, and will be found to present a copy of the negative picture—the whites hollowed out and the lines and shadows in relief.

The specialties of the Woodbury process may be said here to commence: Two plates are now provided, one of polished steel, and the other of lead. The gelatine leaf is placed between these two plates and submitted to very considerable hydraulic pressure, and upon again separating the plates it is noticed that the lead, having proved more yielding than the gelatine, has received a perfect impression of the gelatine picture, which, by the pressure, has been completely embedded

in the lead. In order to ensure success in this part of the operation, the steel plate must be perfectly flat and the flat side of the gelatine leaf placed upon the leaden plate; the steel plate thus coming in contact with the relief of the gelatine.

The lead plate is now to be inked with a semi-transparent composition or ink made of gelatine and Indian ink, carmine or alizarine being introduced to give a tint that shall resemble the ordinary photographic picture. The ink is applied warm. A sheet of paper is now placed on the inked plate, and both are put into a specially-constructed press, in appearance somewhat like an ordinary copying press, where it is, for a few moments, submitted to pressure. The paper, when removed from the press, presents all the appearance of a photograph. It may be mentioned that the gelatine leaf has not been injured during the process, and may, if necessary, be used again. In the process of printing, several presses are fixed to a rotary table, so that after the workman has prepared one press he may pass on to the next in rotation, and by the time the table has completed its revolution the first printing is finished, the paper may be withdrawn and another sheet supplied.

The Woodbury-type method of printing, it will be noticed, differs from every other form used for producing impressions of plates. In all the other methods,—whether in plate printing, in lithography, or by the type-press,—the impression is produced almost immediately on contact with the paper. In the Woodbury-type process, on the other hand, it is necessary for the paper to remain in contact with the plate for the space of about two or three minutes, in order that the almost liquid gelatine ink may have time to become

set. The proofs, when removed from the press, and after drying, are plunged in an alum bath, to fix the print and thus render them entitled to the appellation of "permanent." When dried, trimmed, and mounted on card-board, they are fit for sale as separate pictures. Woodbury-type prints have already become familiar objects for the adornment of our dwellings, where they are gradually superseding engravings, as being less costly. As illustrations for books, Woodbury-types are well adapted, by reason of their combining the peculiar softness of a photograph with the permanent character of an engraving. The limit of number of impressions which may be produced by this process from the same picture, has not yet been ascertained; but it is believed that not more than 1,000 impressions can be taken from a single lead plate without shewing marks of deterioration.

THE STANNOTYPE PROCESS.

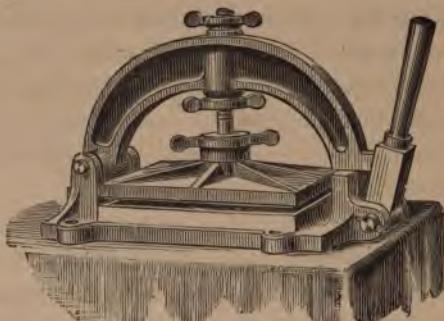
THE latest contribution to Photoglyptie which has been invented by Mr. Woodbury, is designated *Stannotype*, —from *stannum* and *typos*, latin and greek words indicating the nature of the process as printing from tin. Tin-foil is the form of the metal employed as the printing surface.

This new process differs from Mr. Woodbury's previous inventions by dispensing altogether with the application of the hydraulic pressure which forms a necessary and expensive part of the method known as the Woodbury-type process. In place of the leaden plate from which the printing is effected in the older

method, in stannotype the printing is direct from the gelatine mould covered and protected with tin-foil. As the inversion of the image is not provided for in stannotype, as it is in Woodbury-type, it is obvious that the photographic image must be a positive in place of the negative heretofore employed. Any of the ordinary methods of procuring the positive may be resorted to, but the inventor states that "for most purposes the carbon process will be found the most suitable and the simplest."

The sheet of gelatine is prepared in a similar manner to that adopted in the carbon process, but with less colouring matter and of much thicker substance. After sensitizing and exposure to light, the gelatine is squeegeed under water to a sheet of plate glass exactly as in making carbon transparencies. It is then washed to remove all soluble parts, and when dry is coated with a thin solution of india-rubber dissolved in benzole or chloroform. When the solution has been dried by evaporation, a sheet of tin-foil of suitable size is laid upon the gelatine mould. To insure the tin-foil adhering closely to the mould the glass is passed between two india-rubber rollers set in adjustable sockets in a frame, the whole apparatus resembling a domestic wringing machine. The method recommended by the inventor is first to separate the two rollers so as to admit the glass plate easily, and when the plate is about midway between them, then to bring the rollers closer together by means of the screw which regulates the pressure. By turning the handle of the apparatus the plate is now to be gradually passed backwards and forwards until the whole surface of the plate has been submitted to this necessary elastic pressure. If these

instructions be properly carried out all liability to air-bubbles under the tin-foil will be avoided, at the same time that no danger of breaking the plate will be incurred.



STANNOTYPE PRESS.

The Stannotype press differs in construction from that used in the old process. In Woodbury-type the top part of the press is fixed, while the plate on which the mould is placed being loose adapts itself to the rigid top. In the Stannotype press, on the contrary, all the parts are made rigid, so that the pressure is always alike when once the press is adjusted.

The method of printing is as follows:—

In the first place a soft bed must be provided for the plate by a piece of stout specially-prepared blotting-pad cut to the size of the glass. This is to be placed in water until saturated, and then allowed to drain for half a minute. This pad is to be placed upon the press and the glass plate laid upon it. All the screws of the press are now to be loosened, the top or platen of the press having "a perfectly planemetric surface of glass attached to it." This platen is brought to rest upon the plate, but without any pressure beyond

its own weight. The press is now to be closed by drawing the handle forwards, and tightly screwing up the middle screw under the arch of the press. The top screw is also to be tightened, and lastly, the bottom screw is to be fastened until the ball-and-socket joint be made secure. The screws being thus all adjusted, the top part of the press can be moved in one solid piece with unerring results.

"A small pool of warm ink (hereinafter described) sufficient to cover one-sixth of the surface, is poured on the mould, a piece of prepared paper laid upon it, the lid of the press closed, and the handle pushed up. After a lapse of three to five minutes (according to the temperature of the room) the lid of the press is opened and the print lifted from the mould." In the act of printing, the superfluous ink will be forced out round the edges of the mould ; this may be collected and re-melted for future use. The prints when dry are to be laid for about ten minutes in a solution of alum and afterwards rinsed in cold water, in order to fix them. After every three or four impressions the mould will require to be slightly greased with a mixture of paraffin and salad oil in equal quantities and applied with a piece of flannel.

The ink is a specially-made compound of gelatine and water in the proportions of four of the former to twenty or thirty of the latter, according to temperature, colouring matter being added to suit the taste or requirements of the operator. To imitate the ordinary photographic tint add Indian-ink and carmine, or alizarine. The ink should be kept at a temperature of about 130° , while being used, except in hot weather when a lower temperature may suffice. It is stated,

from the experience already obtained, that one pint of this gelatinous ink will serve for the printing of about seven or eight hundred prints of the ordinary cabinet size.

Comparing prints of the Stannotype with those produced by the Woodbury-type process no appreciable difference can be discerned. The new process has, however, the advantage of the saving in outlay effected by dispensing with the hydraulic pressure used in producing the leaden mould; while the Woodbury-type, on the other hand, has the opportunity of repeatedly using the gelatine mould, so as to duplicate plates for printing. If the plan be adopted of steel-facing the tin-foil surface, the Stannotype plate can be made to yield a large number of prints, which will thus obviate the weak point in the process. Also, it is stated that by means of the intervention of a positive even as many as a dozen copies of the negative can be reproduced on the same plate; of course, giving the capability of yielding a corresponding number of copies of the print at a single impression.

When the tin-foil surface has not been protected by being coated with steel, it is liable to injury; but should this occur the application of a few drops of mercury will remove the damaged tin-foil, and a new surface can then, in the course of two minutes, be furnished.



PATENT PHOTO-TYPOGRAPHIC PROCESS,

BY FREDERICK E. IVES.

SEVERAL specimen blocks of this process have already found their way into publications on this side the



PORTRAIT OF W. B. WOODBURY.

BY IVES' [PHILADELPHIA] PATENT PHOTO-RELIEF PROCESS.

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Atlantic, although the invention dates from Philadelphia, U.S., as recently as August, 1881. No authentic account of the means employed in the process has yet been given here. One publication, indeed, which is considered to be an authority upon all matters connected with photography, in place of giving an account of the working of Mr. Ives' process, enters into a description of the supposed analogous process by Paul Pretsch, who "more than thirty years ago produced some of the finest press blocks which have yet been seen, by his method of inducing the reticulation of a film of bichromated gelatine."

The appearance presented by the blocks produced by Mr. Ives' process does not, however, indicate a *chemical* granulation produced in the gelatine film, but shews an appearance arrived at by some distinctly marked mechanical means.

M. Leon Vidal, also, in his *Cours de Reproductions Industrielles Exposé*, gives a specimen block of Mr. Ives' process, but dismisses the subject by saying that it resembles the process of M. C. Petit.

Not satisfied with reproducing the very meagre knowledge of the subject thus to be found, the inventor has been communicated with, and the following has been obligingly forwarded from his pen expressly for publication in this place:—

"My invention may be best described as a photo-mechanical process for producing, direct from nature or from any object which may be photographed, a pure line and stipple picture, in which the shades of the original are represented by black lines or dots of varying thickness, on a pure white ground, and ~~w~~ be reproduced (in the same manner as)

by the ordinary photo-relief and photo-lithographic processes. In short, it is a photo-mechanical method for producing, direct from nature, an economical and superior substitute for pen-drawings.

"The line and stipple picture is produced in the following manner:—A thin film of gelatine sensitized with bichromate of potash, is exposed to light under an ordinary photographic negative of the object to be reproduced, then swelled in water and a cast taken in plaster of Paris. The highest portions of this cast represent the blacks of the picture, the lowest parts the whites, and the middle shades are represented by variations of height between the two extremes. To produce upon the white surface of this relief an impression which will represent the variations of shade by black lines and stipple of varying thickness, an evenly inked surface of elastic V-shaped lines or stipple is pressed against it until the required effect is obtained."

While the picture is in the plaster-cast state it is quite possible to alter it by adding lines or by obliterating them altogether, as may be desired.

The process is at present confined to the establishment of Messrs. Crosscup and West, of Philadelphia, who are working it under the direction of the patentee.

A similar result is also produced by means of a mechanically grained paper, upon which the artist draws his picture. This grain is made by lines printed upon the surface of an enamelled paper in such a manner that the lines may be perceptible through all the darker parts of the picture, and can be scraped away in the "high lights." As soon as the drawing is completed it can be photographed on to metal in the ordinary way.





Specimen of Engraving by
MOSS'S NEW PROCESS OF PHOTO-ENGRAVING.

JOHN C. MOSS, Inventor, New York, U. S. A.
From Dr. Lyman Abbott's "Life and Characteristics of Henry Ward Beecher."

MOSS'S NEW PROCESS.

IN New York a Company is in active operation, entitled "The Moss Engraving Company," which practices all the newest discoveries of the inventor who gives his name to the Company.

The origin of the Company is thus briefly given in its prospectus:—"Something over thirteen years ago Mr. John Calvin Moss began the production of relief plates for letterpress printing by the scientific process of photo-engraving. Like many other experimentors and inventors, Mr. Moss was entirely dependent upon his own exertions and resources, but he had the active assistance of his wife, and finally, when success crowned their efforts, they began together systematically, in their own dwelling, to produce engravings—thus laying the foundation of the business which has since become so vastly extended."

As to the nature of the process which it is the object of the Moss Engraving Company to develop, the proprietors distinctly state that the process is "secret, not patented;" but they have furnished the materials from which the following account is compiled, which gives "all that the inventors care to have published."

It is acknowledged that the Moss process is based upon the knowledge of the changes as to solubility and expansion which bichromatized gelatine undergoes after exposure to light. The detailed particulars of the method of utilizing this discovery of the properties of gelatine for the purpose in question are thus given:—

"A glass or metallic plate is coated with a mixture of gelatine and bichromate of potash, which is allowed

to dry, and afterwards is exposed to the sun through a photographic negative. It is then immersed in cold water, when the parts protected from the light by the negative rapidly swell, while the parts not so protected are hardened and do not swell, or at least not to the same extent. This gelatine surface then becomes the matrix from which through intermediate steps the final plate for printing is formed."

This is in substance the discovery by Paul Pretsch of the property of bichromatised gelatine to expand when protected from the action of light. The knowledge of another property of gelatine, similarly protected, to retain its solubility, while that acted upon by the light becomes hardened, was the subject of Fox Talbot's researches and experiments. This discovery was equally valuable to the photographic engraver, who utilized the knowledge so obtained, by washing away the parts of the picture thus protected and retaining the other parts which contained the lines of the drawing.

These processes, as already stated, form the foundation upon which the work of the Moss Engraving Company is avowedly conducted; but the inventor claims that their exceptional results are also in great measure due to some modifications which have arisen from individual experience, and which are guarded with secrecy. To use the language of the Company, "it is a combination of certain elements of other processes for the purpose of securing completeness and delicacy of detail, together with satisfactory depth and smoothness of lines." Hand-touching is freely resorted to after the blocks are produced, and is termed "trimming" the plates,—an operation in which skilled artists

exercise the graver in order to render the lines sharp and clear and to cut away the tints for the high lights.

The process of photo-engraving generally has been briefly described as being developed from the following requisites:—1st, a sharp negative of the object; 2ndly, a sensitized gelatine picture produced from the negative; 3rdly, developing the drawing either by swelling the unused parts or by washing them away altogether; and 4thly, using the picture so obtained as the matrix for casting in hard stereotype metal or for electrotyping a block for surface-printing.

These are the general outlines of photo-engraving, and the variety observable in the work of different engraving establishments is due entirely to the varying experience and skill of the different operators.

There is one thing upon which the success of these processes greatly depends, and upon which the Moss Engraving Company lay particular stress, and that is the necessity for the drawings furnished to them being from the hands of artists who not only have a theoretical knowledge of the peculiarities of the work, but have also some actual experience of its requirements.

“The very finest results in photo-engraving are undoubtedly obtained from pen-drawings, although very choice prints are also made from chalk drawings on grained paper.”

For the benefit of artists proposing to take up this particular branch of the art, it may be mentioned that a highly-finished, smooth, and absolutely white Bristol board is the best material. For ink, use perfectly black Indian Ink, which may be improved by a few drops of prepared ox-gall. In cross-hatching, which

may be freely employed for this description of work, wait until the first lines are dry before crossing them with others. If the original outline of the design has been made in pencil all the pencil lines must be removed ; bearing in mind that every blotch or smutch left on the drawing will be reproduced on the plate.

It may often be desirable for the artist to take an actual photograph to furnish the outlines of his subject. The artist goes over such outlines with his pen in Indian ink, and when he has thus secured the principal lines, he may discharge the photographic colour altogether by flooding the picture with a solution of bi-chloride of mercury in alcohol. The proportions are 1 oz. of the mercury to 1 quart of the alcohol. Steel pens are strongly recommended for this work.

P H O T O G R A V U R E.

THE late Mr. H. Fox Talbot in 1852, and again in 1858, obtained letters patent for processes with the above designation. Although not supposed at the time to be very successful, Mr. Talbot's discoveries have given rise to similar processes which are now extensively used. The object sought to be attained in these processes is to produce a plate that shall be capable of yielding impressions at a copper-plate press, without the intervention of the engraver. The following description is from the specification of Mr. Talbot's second patent dated 1858 :—

“ About a quarter of an ounce of gelatine is dissolved in eight or ten ounces of water by the aid of heat. To this solution is added about one ounce by



Peint par Auguste Flameng

Photogravure Gouyn & Cie

BATEAU DE PÈCHE DE DIEPPE



measure of a saturated solution of bichromate of potash in water. The mixture is strained through a linen cloth, and should be kept in a dark place."

The copper plate being rendered perfectly clean the gelatine mixture is flooded over its surface, the superfluous quantity being allowed to drain off. Gentle heat is then applied to the underneath surface of the plate, when the mixture will dry, leaving a thin pale yellow-coloured film evenly covering its entire upper surface. The plate is then placed in contact with the subject (either photograph, drawing, or copy of engraving) in a photographic printing frame and exposed to light. The result will be that the pale yellow colour of the gelatine will become darkened into brown wherever the light has acted, thus retaining the image or drawing, while the parts unaffected by the light exhibit their original colour and qualities. An acid solution is now laid upon the plate, and the parts of the gelatine which have been protected from the action of the light will soon be dissolved, and the acid will bite into the parts of the plate thus exposed; while the gelatine which has been acted upon by the light has been so far hardened as to be capable for a time of resisting the effect of the acid. The plate is now cleaned, and the drawing or subject is found to be engraved upon its surface, although not so effectually as when done by the engraver. While the production of the outline and of all the finer parts of the subject are good, the want of depth is the one drawback to the process, and shews itself particularly in any broad patches of shadow, which will present a grey and indistinct appearance in the centre, instead of the full

to overcome this defect the

The pictures produced by these processes of Photogravure—which only differ, it is believed, in the peculiar manipulation of the individual operator—present an appearance that are equally admired by artists and by the public for the delicacy and clearness of the gradations of tone. They preserve many of the characteristics of paintings, and resemble silver prints in the softness given to figures and drapery.



THE DIRECT PHOTO-ENGRAVING PROCESS.

THIS is described by the Company formed to develop its capabilities as a *secret* process. So much information as the promoters vouchsafe, therefore, must be supplemented by conjectures formed by those who are capable of judging of causes by the results which are produced. The process is applicable, it is said, to a variety of decorative purposes, but its value as a means of book illustration is all that can be here taken into consideration. "The Direct Photo-Engraving Company" claims for the process that "it has been gradually perfected during the last twelve years," and is capable of "results hitherto deemed impracticable."

Although it is confessed that specially desired results are best attained by particular methods of drawing, the process is said to be equally applicable to the reproduction of drawings in pencil, pen-and-ink, chalk, brush work, or wash. Half tones are also successfully reproduced by this process.



The pictures produced by these processes of reproduction—which only differ, it is believed, in the precise manipulation of the individual operations or instruments that are equally utilized by all—make no pretence for the delicacy and refinement of the gradations of tone. They preserve many of the characteristics of painting, and resemble other prints in the softness given to figures and drapery.

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TYPE-BLOCK REPRODUCED BY THE PHOTO-ENGRAVING COMPANY, LIMITED.

13, WATERLOO PLACE, LONDON.

ART ILLUSTRATION.

the prints produced by these processes only differ, it is believed, in the character of the individual processes, which are equally well adapted for the delicate and rapid work of time. They produce many varieties of prints, and require no particular skill to figure and drapery.



THE DIAZET PHOTO-ENGRAVING FEDCOKS.

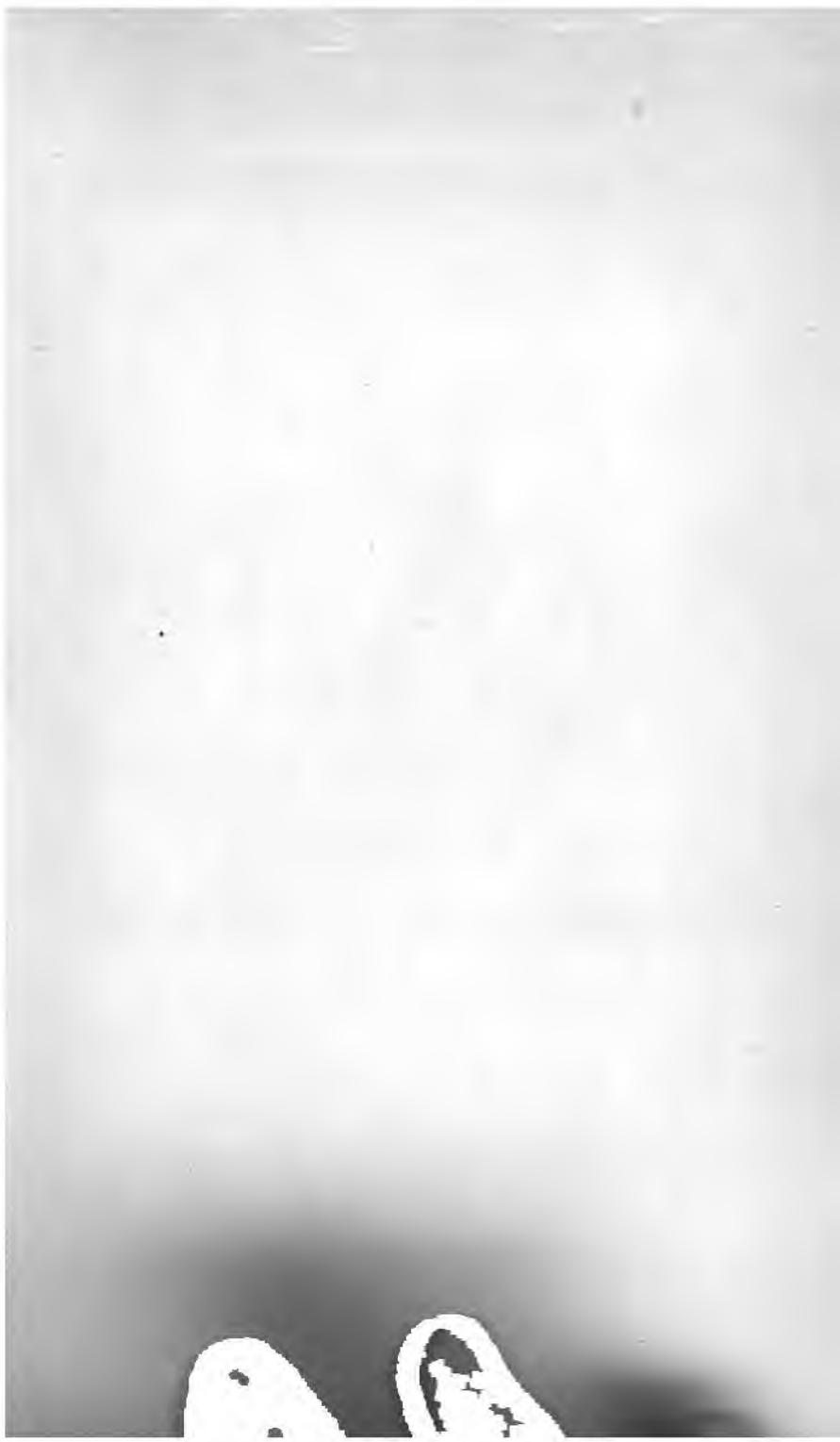
This is described by the Company formed to develop the photo-engraving process. "The prints produced by this process are similar, therefore, to those produced by the processes now used in engraving, but, of course, by the reverse method. The engraving process or application is a process of engraving purposes, but the reverse process of illustration is all that can be done with engraving. "The Diazet Photo-Engraving Company states for the press that "The engraving process, invented within the last twelve months, consists of three distinctly defined operations—



TYPE-BLOCK REPRODUCED BY THE PHOTO-ENGRAVING COMPANY, LIMITED.

13, WATERLOO PLACE, LONDON.

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THE TAKING OFF² SIDE

PHOTO-RELIEF PROCESS.—By JOHN SWAIN.

The word "direct" is introduced into the title of the process because the photograph of the drawing to be reproduced is applied "direct" to the printing surface, "without the necessity of transfer or other manipulation." Photographic pictures from nature are, therefore, admissible equally with drawings by hand, and in such cases the intervention of the artist or draughtsman may be dispensed with. The power—said to be unique—is also claimed for this process, that from the same photograph may be produced a drawing upon a lithographic stone, a block in relief for printing at a typographic press, and a bookbinder's block for illuminating the cover of a book. This contention on behalf of the process is sustained by the illustrations to this work which give a photo-lithographic plate and a photo-relief print from the same subject. It is also claimed that a practically indestructible lithographic stone can be produced in which the drawing upon the surface improves, both in depth and clearness, by printing.

The work produced by this process presents all the appearance of zincography of a very good quality.



P H O T O - R E L I E F E N G R A V I N G .

THERE are several establishments in this country which practice this process, among whom may be mentioned Messrs. A. & W. Dawson, Mr. John Swain, The Direct Photo-Engraving Company, and Messrs. Richardson, Koolman & Isger. In America possibly such establishments are more numerous than in England. The Photo-Engraving Company and the

Moss Engraving Company, of New York, are credited with holding the principal places in character of work. All these firms are supposed to work upon the same method, although possibly with some slight variations in detail.

The first requisite is a drawing in line—not in wash—similar to such as are used for *fac-simile* wood engraving. The drawing should be made with jet-black ink on white paper or cardboard, a blue-white tint being preferred to a yellow-white. Drawings made in wash can also be converted into electro-relief blocks by this process; but owing to the necessity for exceptional care and precaution in printing such blocks, they must for all useful purposes be considered impracticable, particularly where rapid printing of large numbers is demanded. Proofs taken from a wood block or from a steel engraving, are also available.

The drawing being prepared, the photographer mounts it carefully and proceeds to take a photographic negative in the ordinary way. In order to provide against any possible variation in the photographic image, which might be occasioned by even a slight vibration in the building occupied by the operator, two arrangements are made use of. In one, the camera and the object-stand rest upon a specially constructed and isolated brick elevation on arches upon which is laid down a pair of iron rails. Upon these rails the camera and object-stand can be adjusted to the required distance, and as the operator walks upon a flooring entirely disconnected from the foundation of the miniature railway, vibrations caused by his movements cannot possibly affect the process of taking the photographic image.

Another method, which is employed by the Moss Photo-Engraving Company of New York, arrives at the same result by different means. Both camera and retaining device for the picture to be photographed are suspended from the ceiling of the room by a single rope. This prevents independent accidental movements of camera and object. Should one or the other move, in however slight a degree, the accuracy of the photograph would be impaired; but so long as both must move together, if at all, their relative positions must always remain the same.

To resume the description of the process: It is not stated, but there is no reason to doubt, that the material upon which the photographic image is taken is glass coated with a film of bichromatized gelatine; or it may be photographed direct to a zinc plate and afterwards bitten up. [See ZINCOGRAPHY.]

The photographic print thus obtained is developed in such a way as to cause the "whites" to swell or rise up, leaving the black lines of the drawing sunken. From this developed print a plaster mould is next taken, and from this a mould in wax, which is then fit for the hands of the electrotyper, who, after further "building up" the broad whites, will place it in the bath for the copper shell to be deposited in the ordinary way.

A U T O T Y P E.

THIS process is founded upon the combined inventions, which have been patented, of Swan, Johnson, Sawyer, and Lambert, and is "a new method of photographic printing, which, substituting the ordinary permanent

pigments of the artist for the chemical salts hitherto employed, ensures all the beauty of silver prints without their fatal effects of fading."

"Autotype is specially adapted for the reproduction of works of art. Utilizing all the permanent pigments of the palette, it reproduces in monochrome the artist's own work—his touch, the spirit of his brush —without the intervention of another hand; hence its title, Autotype."

Such is the description of the process given by the Autotype Company, which claims the titles "Autotypes" and "Chromotypes" as its special trade marks.

The method adopted is an adaptation of the gelatine process, and it is stated that although it possesses many advantages for "certain purposes of book illustration," excellence and fidelity to the original being specially claimed, yet it is acknowledged to be too costly in the process of printing. For this reason Autotype illustrations are scarcely admissible for editions of above five hundred copies.

At their works at Ealing Dean, the Autotype Company enlarge portraits "by a permanent carbon process" from *carte-de-visite* portraits, the large photographs for which Mr. Vernon Heath is so celebrated being produced by them from his small pictures. Before, however, such enlarged pictures are ready for delivery they require to be touched or toned down so as to hide faults of spots which are made prominent by the process of enlargement.

The following gives in a concise form the method adopted by the Autotype Company:—

"The reproduction of a picture by the Autotype process requires the co-operation of the painter with



FROM AN ETCHING ON GLASS BY W. S. GOORMAN,
C. HANCOCK, PHOTO-ENGRAVER, 3A, ENNERDALE ROAD, HITHER GREEN, S.E.
MARCH, 1882.

the photographer, and is effected in the following manner:—A negative is taken direct from the picture, and from this negative a transparency is printed. A second, and enlarged negative is now made, the size depending upon the character of the work of the artist. A print in pigment is taken from this enlarged negative, which may be upon almost any material, at the pleasure of the artist, such as rough or smooth paper, canvas, or panel. Upon this print the artist works in monochrome, correcting all that is faulty in the lights and shadows, and reproducing his picture himself upon the lines of the photographic copy. When the monochrome picture is completed to his satisfaction, it serves as an original, from which a negative of any size smaller than itself can be taken in a camera, and from this negative any number of permanent Autotype copies can be printed in the ordinary manner.



ETCHING UPON GLASS.

THIS is a combination of etching, photography, and zincography, and the results produced are much like those attained by Dawson's Typographic Etching, although the method of procedure is totally different.

Upon a sheet of glass coated with a thin film of collodion the artist etches his design. For the purpose of etching with so slight a coating as is here required, the etching needle may be made of any material that will scratch away the film with a clear and well defined mark. Steel, bone, or quill are equally admissible for the material out of which the etching point may be made.

The drawing being finished, the plate becomes a negative, to be afterwards printed photographically upon a plate of zinc previously sensitized, and subsequently bitten up in the manner adopted in zincography.

The term "*scratched* negative"—in contradistinction to *photographic* negative—has been applied to this method, from the fact of its being the result of a drawing scratched or etched upon the glass.

The materials employed are pleasant to work with and do not offer any technical difficulties to the artist accustomed to pen-and-ink drawing; but the collodion is a somewhat treacherous substance to deal with, as after a time it is apt to become brittle, and instead of preserving a clean cut line, is liable to chip off in patches.

This is a process which Mr. Charles Hancock claims to have discovered, and which he is now working successfully.

BRUCE'S WHITE-LINE ETCHING.

THIS is the invention of William Patrick Bruce, of Kinleith Currie, Midlothian, and has been patented. In the specification, dated January 11th, 1883, it is called "a new process for the reproduction of designs applicable to the illustration of books;" and the process appears to be theoretically simple, according to the inventor's description, although in its practical application artists will find that all their old methods of procedure have to be reversed.

A plate of copper or zinc is coated with an etching ground in the ordinary way, and upon this plate the

artist etches his design ; but in place of drawing the *black* lines which are to form the picture, he etches the *white* lines,—leaving untouched those portions that are intended eventually to be printed. The whites of the picture being thus indicated by the removal of the etching ground, the plate is submitted to the action of acid to bite away the exposed metal, leaving the subject of the design in relief. Where the parts to be bitten away are required to be produced in half-tint, it will be necessary, after a slight biting, to have recourse to stopping-out by some acid-resisting varnish, as is practised by aqua-tinters. The inventor suggests that “touching up” where necessary may be freely practised by means of the graver.

The patentee claims as his invention “the coating a metal plate with etching-ground, then producing a design thereon by removing parts of such ground with an etching needle or tool, and with the aid, if need be, of lines drawn with varnish upon the parts of the plate from which the ground has been removed by the tool ; then biting the plate and dissolving away the exposed metal ; and finally, when the plate is properly finished and mounted, printing therefrom in a typographic printing press.”

A special multiple form of etching instrument is recommended, which is formed by a number of needles placed side by side between two metal plates clamped in an ordinary crayon holder. Each stroke of this tool produces a number of parallel lines, corresponding with the number of needles forming the instrument, and will doubtless be found very useful. The artist’s work in this process closely resembles the practice of the engraver upon wood.

Bruce's process is one of those cases in which, all the separate parts having been previously known, the novelty of the combination renders it suitable for the protection of a patent.



CHROMO-PHOTO-LITHOGRAPHY.

THE power to photograph in the hues of nature, with the perfection attained in monochrome pictures, is not yet absolutely accomplished; and until this is achieved, the effort to print the photographic image in colours cannot hope to be successful. Some steps in this direction have, however, already been taken, and the advance thus made leads to the anticipation that complete success may ultimately be attained.

There have been several workers engaged in this attempt to obtain the photographic image in the natural colours, and among these may be mentioned the names of MM. Poitevin, De St. Florent, Niepce de St. Victor, Ducos du Hauron, Cros, and Ed. Becquerel. Their labours have been directed to the separation of the light into the primitive colours, and thus to procure three separate corresponding plates or printing surfaces, and by printing these in succession upon the same sheet to produce the completed chromo picture.

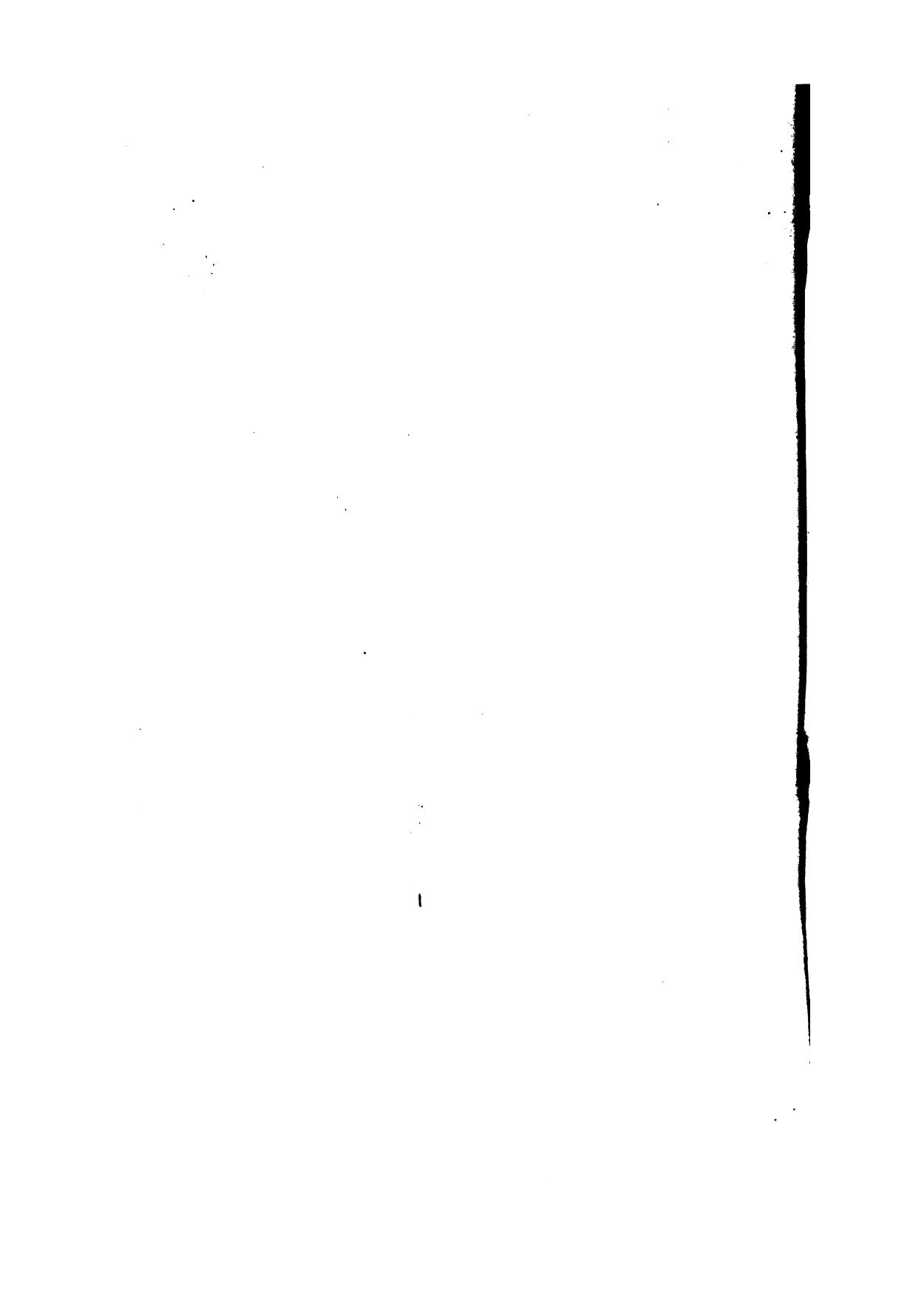
Thus—a green glass being interposed in the camera between the object to be reproduced and the sensitized surface, a *negative of red* is produced, all the red rays having been destroyed by the process. In like manner an orange-yellow glass annuls the blue rays, giving a *blue negative*; and a violet glass, discharging the yellow



PHOTO-CRHO-MO-LITHOGRAPHY.

(TEXTILE FABRIC.)

BY W. GRIGGS, HANOVER ST. PECKHAM, S. E.



colourization, gives a *negative of yellow*. If these separate negatives of the same subject be applied to separate stones, in the ordinary method of photo-lithography, the necessary colour stones for a chromo picture are provided. Such is the theory at present held in relation to this matter, and it is upon these lines that the efforts to obtain results in chromo-photo-lithography are made. To a certain extent it must be admitted that these efforts have been successful. Reproductions of the photographic image of textile fabrics have been accomplished; but it is conjectured that, even in these cases, the stones upon which the separate colours have been photographed have been subsequently subjected to manipulation by an artist.

S T E N O C H R O M Y.

THIS is a means of printing in colours, in which all the various colours are produced at one operation. It can scarcely, however, be called a method of printing. A slab made of solid colouring matter is arranged according to the varieties of colour in the picture to be reproduced, and from this slab an impression is taken upon paper, somewhat after the manner of marbling for the edges of account books. Upon this coloured impression a photoglyptic picture is printed, and the result is a coloured print, giving the appearance of an oleograph or photograph in colours. Although some pleasing pictures have been produced by Stenochromy, it has but little artistic or commercial value, and it is believed that it has now been abandoned.

H O E S C H O T Y P E.

THIS is the most important as well as the most recent addition which has been made to the art of chromo-graphic printing, and is the invention of Friedrich Carl Hoesch, a photo-lithographer of Nürnberg, after whom it has been named. The process has been patented, and is being successfully worked in Germany and other countries. The patent for England has been granted to Mr. John Rudolph Meihé, with the title of "Improvements in Polychromatic Printing," and the specification is dated February 10th, 1882.

The peculiar object of the invention is the production of pictures resembling chromo-lithographs of the highest class. This object is attained by means of separate printings in coloured inks from plates of glass which have received a photographic image of the picture to be printed. Inasmuch as the drawing upon the plates, for printing the various colours required, is effected automatically by the aid of photography, and the printing from the plates is performed upon a lithographic press, the process is fitly described as a combination of heliotype and lithography.

A photographic negative of the object or picture is taken in the camera upon glass, and half-a-dozen heliotype impressions are printed therefrom. One of these impressions is marked as a guide or key for preparing the several colour plates. This is done by reference to a "chromatic scale," which forms a special part of the invention secured by the patent under consideration. This "chromatic scale" shows the separate primitive colours and their various combinations in almost every variety of intensity, and is worked

up to as many as 1,600 different gradations of tint as the result of five separate printings.

With the scale before him the operator ascertains with exactness the degree of strength required for each colour to be used, and marks his key-impression accordingly. The next step is the application of this key. The operator takes one of the plain impressions and works it up, for the yellow plate, for instance, in accordance with the key, by painting with a wash of grey all the parts of the picture in which the yellow appears either alone or in combination with some other tint, the varying strength of colour being indicated by a proportionately lighter or darker shade of the grey wash. Whenever the yellow colour is not required in the picture, that portion of the drawing has to be "stopped out" by being painted over with an opaque white pigment. An impression is similarly prepared for each colour to be used, and it will be noticed that the most delicate variations and gradations of tint are obtainable by the means explained.

These worked up impressions—which are the equivalents of the various colours, but produced in grey—are now to be treated as so many originals from which new photographic negatives are to be taken and transferred to sheets of glass which have been previously rendered sensitive by coating with a film of bichromatized gelatine. The glass plates thus prepared are now ready for printing at a lithographic press, which may be either worked by hand or by steam-power. Some slight modification of the ordinary lithographic machine are suggested, such as providing a perfectly level bed for the plate, and giving special attention to the inking apparatus.

The use of the chromatic scale materially facilitates the work of preparing the colour plates ; and the inventor asserts that the only skill required in the operator is the ability to use a brush with ordinary dexterity. Another important advantage claimed, is the certainty experienced in the results. As mentioned in a previous page it not unfrequently happens in chromo-lithography that owing to weakness in one or more of the printings, the precise effect desired is not attained. In Hoeschotype, on the other hand, no danger of this sort seems likely to occur, if ordinary care be observed.

In all chromographic processes the number of printings to be employed will depend upon the character of the subject or picture to be reproduced ; but of whatever description the drawing may be, it is claimed for the Hoeschotype process that fewer printings are necessary than by the older methods. Five separate printings, it is declared, are ample for such pictures as the chromo-lithographer would require ten or more to produce.

The patented process has not yet been worked in this country, and the comparatively few specimens which have been exhibited are mostly of German production. For this reason, Hoeschotype is at present at a disadvantage. A comparison, however, with some of the better class of chromographic pictures is in favour of the new process, and the great perfection in the graduated tints of a picture which appear to be within the capabilities of Hoeschotype, are very perceptible.



CHAPTER III.

Electrotyping.

INTRODUCTION.



Y whichever process the original block may be produced, it becomes necessary to find some satisfactory means of duplication.

The scope of this work, therefore, requires that some allusion should be made to the various processes in existence for this purpose.

Stereotyping, however useful for type work and for ordinary printing, is quite out of the question for art work, as notwithstanding all the modern improvements the results are too clumsy for anything requiring sharpness and delicacy in the results.



THE CELLULOID PROCESS.

THE most recent invention in connection with this subject is that which has been patented for England by Albert Sauvée under the designation of the

“Celluloid Process.” This invention which is the discovery of Mons. Jannin, of Paris, consists in the use of celluloid for the material for the block, and a cement formed of metallic oxide as the moulding material. “By means of a cement composed of metallic oxides and glycerine the impression of the engraving is taken. This cement has the property of hardening in contact with heat. The impression obtained is heated to 120° cent^e on cast iron plates, the celluloid being likewise heated. The mould thus acquires the hardness of metal, while the celluloid becomes soft, and capable of taking the most delicate impression. In submitting the celluloid and the mould to pressure, a perfect cast is obtained, which latter is then cooled and mounted like ordinary stereotype.”

This “Celluloid Process,” has been already sufficiently tested to shew its value; but it is believed that difficulties of arrangement among the proprietary has hitherto prevented its general adoption in this country. It may be described as yielding a plate which lends itself very kindly to the exigencies of printing where long numbers are required, and the impression is equal to an electrotype for sharpness of outline.



ELECTROTYPEING FROM WOOD ENGRAVING.

It has been previously stated that the necessity for electrotyping blocks arises not only for the purpose of duplicating the block, but as a precautionary measure in preserving the original block. Where the

original block has been a costly one it would be manifestly unwise to incur the risk of any accident that might happen while printing. An electrotype block can be replaced (the original being at hand), at far less cost than the repair, and certainly far less than the entire re-engraving, of the original. The great saving of time in replacing the block—which is really almost of more importance, in some cases, than the saving of cost, is an item of consideration.

The outlines of the process are as follows :—The block being ready for the electrotyper and cleaned with turps, he proceeds to take a mould in wax, which is coated with black lead, because wax is a known non-conductor of electricity, and plumbago or black lead also possesses that quality in a high degree and can be applied without injury to the mould. The mould is then placed in the battery and copper is deposited in the mould until a shell of the required thickness is obtained. This being done the shell is “backed-up” by pouring in stereotype metal to the thickness of a stereotype plate, which is then mounted in the ordinary way and is ready for the printer.

In the process of electrotyping, the practical objection has been to the time necessary for the deposit of a sufficient thickness of metal in the shell, and this difficulty has been overcome by the use of the Dynamo-electrical machine which very considerably reduces the time occupied in the bath.

The work of the electrotyper was formerly confined to the duplication of wood engravings; but copper or steel plates are now submitted to the like operation with marked advantage.

ELECTROTYPEING FROM COPPER OR STEEL PLATES.

COPPER-PLATE printing has always been considered to be under a great disadvantage where either speed or large numbers of impressions were needed. This was partly from the tedious nature of the process of printing, and partly from the fact of the plate so soon shewing signs of wear. The constant rubbing and polishing of the plate before taking each impression, tend steadily but surely to obliterate the work of the engraver. Hence it is that early impressions of copper and steel plate engravings are highly prized by collectors and command in consequence increased prices.

A "proof before letters" indicates the very earliest impressions; the next grade in value are "proofs" after the lettering has been added. Both descriptions of proofs are generally printed upon India paper, which from its fine and silky texture shews the delicate lines of the print to advantage. The ordinary printing, designated "impressions" or "plates," constitutes the cheapest form of copies of engravings.

It is obvious that the popularizing such works of art was impossible by the customary process, as editions consisting of extensive numbers were altogether out of the question.

To obviate these difficulties, and in order to give copper-plate printing some better opportunity of competing with the other methods of multiplying impressions, the plan has been adopted of taking electrotypes from copper or steel plates and coating

the electrotype with a steel face. The details of the method adopted are briefly as follows:—

A mould is taken from the original plate in a specially prepared material, and with considerable care, necessitated by the work on copper plates being more fine and also more shallow. This mould is then placed in the battery where it usually remains for two or three weeks, in order that the "shell" of copper may be considerably thicker than is required for "relief" work. The proper thickness of copper having been deposited in the mould, the shell is filed or ground flat on the back, and the face coated with a deposit of iron,—a process commonly called steel facing. The electrotype plate is then ready for printing; and as the original plate remains perfectly uninjured, fresh electrotypes can be taken as often as may be required. By taking two or three wax moulds a corresponding number of electrotypes may be prepared simultaneously.

As soon as the steel face wears off in the printing, which is readily detected by the colour of the copper becoming visible, the plate can be re-coated with iron without injury to the plate.





CHAPTER IV.

General Decorations.

INTRODUCTION.



THE style of "General Decorations" which would seem most naturally to arise out of the subject specially treated of in this work, is that form which is more particularly comprised in works of art used to adorn the walls of mansions and other dwellings. This would obviously include paintings in oil and in water-colour, engravings of every description, photographs, oleographs, lithographs, chromo-lithographs, and the products of most of the chemical and photographic processes of engraving which have already been enumerated and described in these pages.

The subject of the permanent decoration of walls, would need considerable attention if anything approaching an exhaustive treatise were to be attempted; but as only a very slight allusion to the subject is possible, it must suffice to observe that there is in this department,

as in many others, a manifest tendency to revert to the methods and tastes of our ancestors. Thus the encaustic tiles now so fashionable for covering walls may be said to be a return to the use of the inlaid marbles and stone formerly practised by the Egyptians for a similar purpose; while the decoration of walls by stencil, in distemper, or by means of cartoons, may be accepted as revivals and imitations of the Roman frescoes. The ancient woven fabrics supplied by the Persian looms, as well as the hand-worked tapestries of a somewhat later date, are vividly brought to mind in the endless variety of modern materials now adopted for similar purposes of decoration.

PICTORIAL DECORATIONS.

ONE of the earliest forms of pictorial or artistic decoration was by means of paintings executed in oil on the panels of wainscoted or boarded walls. These were, of course, permanent decorations forming part and parcel of the structure itself, and of which numerous examples are still preserved in cathedrals, churches, and public and private buildings both in England and on the Continent. This style of decoration was eminently suitable for baronial halls, and the mansions of the nobility and aristocracy, and it was in this way that not only the portraits, but the historical events of a family became handed down to posterity. Subsequently, as the taste for such decorations was acquired by persons of somewhat more modest means, the plan was adopted of having pictures painted either on wood (still technically

called "panel") or canvas, in a separate or detached form, for the greater convenience of removal. The field for the exercise of artistic talent thus became marvellously extended, and as a natural consequence, was the means of developing as well as fostering and encouraging genius in the graphic art. That there existed and still exists an appreciation of such modes of decoration, is evinced not only by the encouragement afforded to artists, but also by the pains which have been taken, often under very adverse circumstances and in spite of accidents, to preserve such a very considerable number of the works of the great masters who flourished in a previous age. In like manner it may be believed that this admiration for the productions of a departed race of great painters is possessed in almost a greater degree by the present age, which may also boast of having superior advantages in the way of artistic discrimination. There can be very little doubt that the advancement in artistic knowledge so perceptible in the present day is due to the influence which has been brought to bear upon public taste by the facilities afforded by the modern processes of photographic engraving. Formerly, only those who possessed the means as well as the inclination to travel to the great centres of art treasure, could become acquainted with the works of the great painters; but now copies of the masterpieces of the Continental schools of art are to be found adorning the homes of the artisan. These advantages are due to the revelations of science which have given the means of reproducing paintings, with all the fidelity of sun-pictures and the permanency of engravings, at so small a cost as to be literally within the reach of all.

In undertaking the work of decorating the walls of a room, the choice of pictures, as to the subject as well as the prevailing tone or colour, is a question absolutely of individual taste, and it is only necessary to make two suggestions which are dictated by common sense. In the first place, pictures having a painful or distressing idea for their subject should be avoided, as however admissible in a picture gallery, where they need merely be subject to a transient inspection, they cannot but produce unpleasant sensations when the eye may be compelled to dwell upon the details day by day. Secondly, in the permanent decorations of the walls, and also of the floor, neutral tints should be selected so as not to destroy the artistic effects of any pictures destined to become the ornaments of the apartment.



PICTURE FRAMES.

It is impossible here to resist allusion to the barbarian who, in a spirit of the most severe sarcasm, appraised the contents of a picture gallery at the value simply of the frames! Without subscribing to such an essentially commercial estimate of works of art, it is yet to be acknowledged that the choice of the frame is a matter worthy of some consideration.

Gilt frames should be used for large pictures painted in oil colours, but bronze frames are more suitable for moonlight or evening subjects. Ebony frames may also be employed.

Water-colour sketches, engravings, photographs, and lithographs should always be mounted with an ample margin, and frames made of maple, satin-wood, oak, walnut, or rosewood, or their imitations, may be selected according to the taste of the individual. When wood is the material employed for the frame in which to place an engraving, the edges of the frame should be bevelled, thus avoiding any shadow from the frame, and at the same time assisting in giving the appearance of throwing the picture forward. A narrow gilt bead on the inside of the frame may be added with advantage, and for the sake of preservation this bead may be placed under the glass. Gilt composition-frames are also most commonly used for engravings; but in this as in everything else it would be well to avoid those frames that have only cheapness to recommend them. Among modern examples of frames may be named flat oak frames coated with gilding.

"Mounts," as they are technically called, made either in white, grey, or pale buff Bristol board, are great and desirable additions, the edges of the mounts being either plain or gilt. The colour of the mount to be selected should depend upon the character of the picture.



C A R P E T S.

FOR reception rooms the wooden flooring may either be left exposed (in which case the floor should be polished), or the surface may be covered with carpet.

In many Continental towns the fashion of polished floors prevails; in this country, on the other hand, a compromise is effected; the centre of the room is covered with carpet and the rest of the floor is bare. Encaustic tiles in some portions of the interior of a house are advantageously employed on account of their cleanliness.

Possibly the greatest luxury in the way of carpet, where softness of texture is considered the acme of comfort, is to be found in the carpets that owe their origin to the manufactories of the East. Persian, Turkish, and Indian carpets hold the pre-eminent place for this characteristic; and these although costly do not necessarily come under condemnation for extravagance, because they are also very durable. The carpets considered most suitable for dining and reception rooms are those from Turkey and India, while Persian carpets are generally reserved for ladies' boudoirs. All these carpets are to be used for covering the *centres* of rooms (indeed they can only be procured in squares), while the margin should either show the polished wood of the floor, or be covered separately with some description of oil cloth. The nearest approach in home manufacture to these Eastern carpets is the description made at Axminster, and, being woven in breadths, these carpets may be planned to fit the room. There are also the so-called Brussels carpets, velvet-pile, and tapestry carpets, the latter a species of Brussels of a cheaper and less durable description. Kidderminster carpets are only employed for bed-room purposes.

For hearth rugs, besides those made to match the particular description of carpet selected for the room,

natural skin-mats, of which there is a great variety, are now frequently used to occupy other ornamental positions as well as the ordinary one before the fireplace.

The size of the room will need to be taken into consideration when selecting the carpet, as large or glaring patterns are very objectionable if the room be small. Where the pattern and colours of a carpet are not too obtrusive it will be found that the furniture of the room, as well as the wall decorations, will be seen to better advantage. Bordered carpets are only suitable to large rooms.



WINDOWS AND THEIR DRAPERIES.

THE use of stained glass cannot be claimed as a novelty, except in its application to domestic purposes, but the removal of the fiscal impediments to the manufacture of glass some few years since, greatly encouraged the adoption of ornamental glass for ordinary dwellings. In cathedrals, churches, halls, and other public buildings, stained glass has been employed for some centuries—that in Canterbury Cathedral, for instance, dating as far back as 1174.

The earliest specimens of stained glass windows were in the form of mosaics, each colour being a separate piece of glass; but in later times several colours were burnt in the same piece of glass. The taste for coloured and engraved glass for windows seems to be greatly on the increase, and it is now recognised as being useful as well as ornamental. If

the object be utilitarian,—to hide from view anything that is unsightly,—both colours and pattern should be subdued so as not to attract undue attention, otherwise the object will be defeated. For purely ornamental purposes the Renaissance style is the one chiefly adopted. “It is characterized by florid scrolls and panelling, and in especial by Italian roundels, or circular plates of glass painted with a full face, either meditative or grotesque, in the centre of each window. In the colouring, pale yellow and green usually preponderate. A noticeable feature of the revived style is the use of rough bosses or small squares of glass, of blue, olive, or yellow, not unlike the rounded bottom of a wine bottle.”

Judging by the way in which windows are occasionally seen to be draped, it would almost appear necessary to call attention to the self-evident fact that the primary object of a window is to admit light. Stained glass in windows temper and modify the light, and diffuse over the apartment a pleasing tone grateful to the eye; but to hang over the greater part of the window heavy drapery, set, perhaps, in a large gilt cornice, is, in a modern and not too lofty a room, opposed to common sense as well as good taste. Massive draperies are permissible when used over doorways, or as a division in a large room, where exclusion of draught is the object desired; but for windows furniture of a lighter character, suspended from poles of a slight and plain description, are preferable. Lace curtains of an almost endless variety of manufacture, and in elegant patterns, can readily be procured, and fulfil to perfection the double purpose of furnishing a window and admitting light.

FIRE-PLACES AND FURNITURE.

PERHAPS no changes in domestic architecture have been more conspicuous and beneficial than those which the arrangements of the fire-place have undergone. With the free use of encaustic tiles and *plaques* for the hearth, antique fire-dogs, and well carved mantel, the modern fire-place becomes an object of decoration. Science also has shown that the nearer the combustible materials are kept to the floor of the apartment the better will heat be diffused throughout the apartment, and the more healthful will it become.

Most articles of furniture may be made subservient to decorative purposes, and there cannot be any difficulty in selecting such as may be consistent with what style of domestic architecture may be adopted. In this direction also the prevailing taste is certainly in favour of a revival of the old models, and hence furniture of the Tudor, Queen Anne, Modern Gothic, and Early English are to be had. Furniture after the various styles indicated are essentially ornamental, and are procurable in sufficient variety to please every taste; indeed, it might also be said in such profusion as seriously to perplex the taste. Whichever style may be determined upon the only safe rule of guidance is to be careful that no incongruities are admitted, but that all is *en suite*.

Besides all the useful and indispensable articles of furniture, there are many of a purely decorative character, among which objects of Japanese manufacture may be safely included. Although there have not been wanting efforts to make musical instruments

subservient to the purposes of decoration, to the scandal of musical taste ; yet it must be confessed they do not lend themselves kindly to such considerations. It is difficult, for instance, to convert a grand pianoforte into an object of decoration, and under the influence of such feelings, it is almost equally impossible to resist making it available for the display upon its surface of books, pictures, and nick-nacks in general. The makers of such instruments, however, are doing their best towards the desired object of ornamenting the cases of their instruments, so that whatever their form, the appearance shall harmonize with the decorative style of the furniture of the apartment.

No room can be said to be complete in its decorations which does not contain flowers either natural or artificial. A taste for flowers may be placed at the very head of the qualifications of artistic decoration. A room not otherwise distinguishable for elegance, may become a fascinating and attractive apartment by the judicious arrangement of a few—even commonplace—flowers. The decorations of a dining table laden with a profusion of valuable plate, is not half so artistically effective, as one where the chief attractions are glass of various hues and the decorations are natural flowers.

Glass, porcelain, and Parian, are indispensable as material for decoration in homes of taste. Parian statues, Venetian glass, European pottery, not to mention our native manufactures in “ware,” are as accessible as they are necessary for decorative purposes, and they possess the further advantage of allowing of greater variety of choice in the same apartment.

THE subject of *General Decoration* is too extensive in its various ramifications to be treated otherwise than cursorily in this place, and only those subjects are mentioned which appear to arise distinctly out of the subject of "Art Illustration." While treating of engravings as a means of book illustration it was felt to be impossible to resist some observations upon the pictorial decoration of apartments. This in turn led to the consideration of the other branches of the same subject, such as the necessity for a unity of purpose in the various means of decoration. Although no attempt has been made to treat the subject fully, yet it is hoped enough has been said to guide the judgment, and direct the attention to the importance of the cultivation of taste in "General Decorations."



THE END.

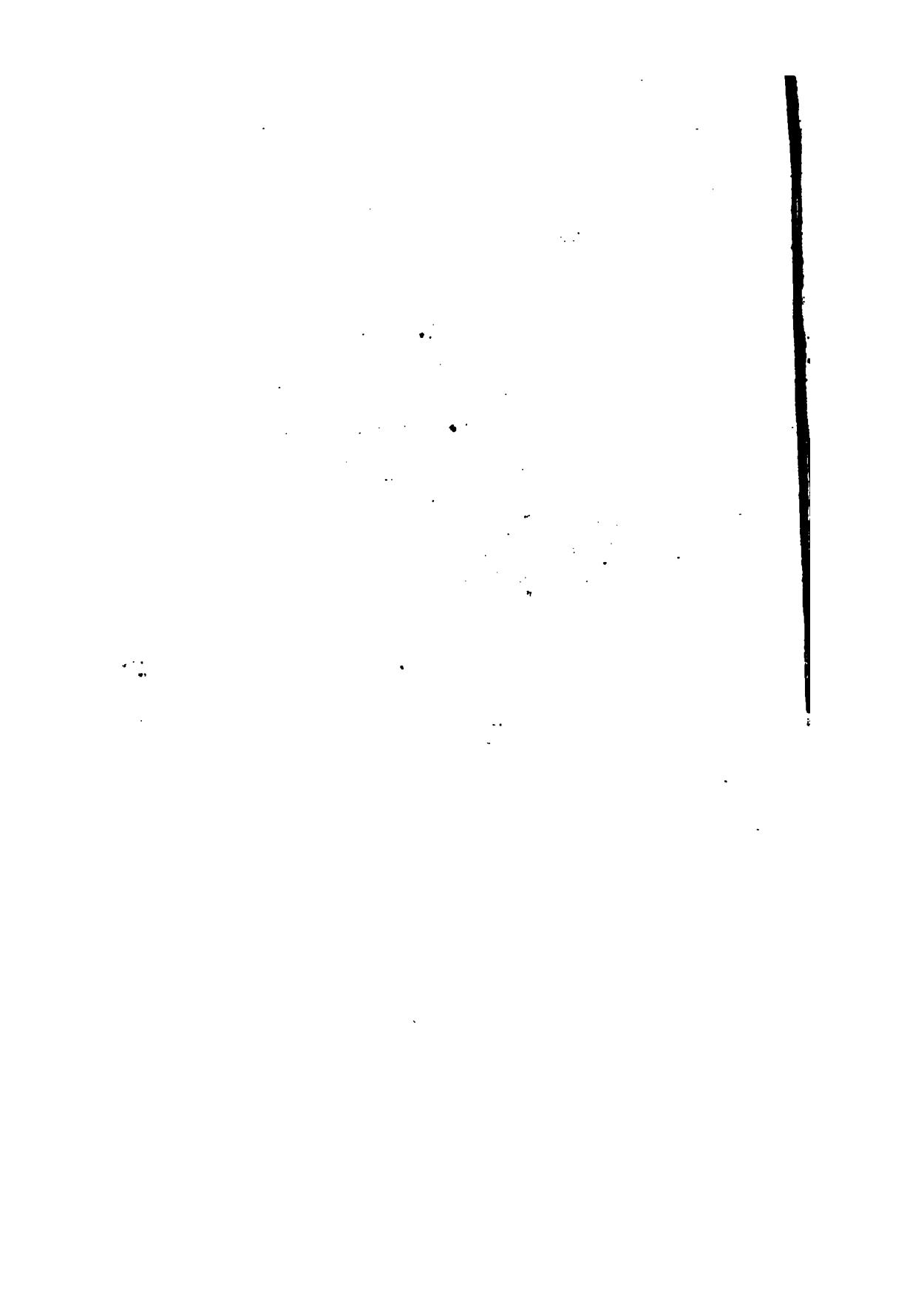


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